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NATIONAL PETROLEUM NEWS

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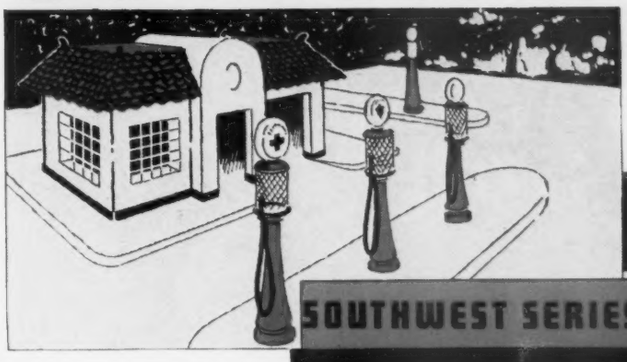

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Christen Towboat To Move Oil On Missouri River

● Inauguration of water transportation of petroleum products on the Missouri river by the White Eagle Division of the Socony Vacuum Oil Co., Inc., was attended by a number of Socony Vacuum officials. See article this issue.

Those on the deck of the new towboat Kansas City Socony are, left to right: S. Hatch, W. D. Fletcher, Raymond Perry and W. B. Jupp, engineering department, Socony Vacuum Oil Co., Inc., New York; C. E. Heyl, manager of marine transportation department, New York; H. L. McReynolds and R. D. Mering, White Eagle sales and traffic departments, Kansas City; N. J. Pluymert, manager of marine equipment construction and maintenance, New York; R. R. Irwin, president of White Eagle, Kansas City; B. B. Jennings, New York; L. L. Marcell, chairman of the board of White Eagle, Kansas City; C. J. Skidmore, manager of distribution, New York; Kenneth R. Elliott, of Elliott Boat & Motor Co., Kansas City; S. B. Parsell, New York, and S. J. Elliott, president of the Elliott Boat & Motor Co.

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LAST MINUTE
OIL NEWS SECTION

News By Teletype From 4 News Bureaus

National Petroleum News

News From Oil Industry Everywhere

VOLUME 29 WEDNESDAY, OCTOBER 6, 1937 NUMBER 40

CLASH ON NATURE OF OIL CASE EVIDENCE

15 Million Cars In Small Income Families By '40

N. P. N. News Bureau

CHICAGO, Oct. 4.—Baird H. Markham, director of the American Petroleum Industries Committee, predicted that, by 1940, close to 15,000,000 families in the low income groups would be owners of motor cars, before the Interstate Conference on gasoline taxation here Sept. 28.

Markham said that automobile ownership among families with incomes of $30 a week or less is expanding at the rate of 1,000,000 a year. "The remarkable extension of automobile ownership among families with low incomes in this country is unparalleled in any other nation in the world," he said.

He stated that the total number of cars owned by U. S. families with low incomes is greater than the total number of automobiles owned by families in all income classes in the entire balance of the world.

Mr. Markham pointed out that despite these facts which show that the bulk of our car owners "have small ability to pay taxes, the tax burden on the motorists has been increased continuously by the federal and state government."

The conference unanimously adopted a resolution urging substantial rductions in gasoline tax rates of mid-western states, pointing out that motorists in the middle west, most of whom earn less than $30 a week and who drive second-hand cars with a value of less than $200, are now paying a volume of gasoline taxes twice that paid in the pre-depression peak year of 1929.

The conference was comprised of delegates representing refiners, distributors and service station operators in Colorado, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, New Mexico, North Dakota, South Dakota, and Wisconsin.

History of Case

In this issue starting on page 30, will be found a supplementary article to this news account of the opening of the oil conspiracy trial at Madison, giving the names of the oil companies and individuals indicted, the history of the case from the time the complaint was lodged with the Department of Justice at Washington, and other important background facts.

Car Output Predicted To Pass 5 Million

CHICAGO, Oct. 4.—With 3,784,000 cars and trucks produced the first eight months of this year, the automobile industry is assured its 1937 output will pass the 5,000,000 mark for the second time in history.

This prediction was made by Alfred Reeves, vice president and general manager of the Automobile Manufacturers Assn., at the annual convention of the National Assn. of Sales Finance Companies held here Sept. 29.

According to Reeves, the commercial vehicle division of the industry is making an especially strong showing. Both from the standpoint of domestic retail sales and production in the U. S. and Canada, the motor truck manufacturers are certain to eclipse the records of all previous years.

Another important factor in the industry's 1937 success, according to Reeves, is the increased demand for automotive products emanating from foreign countries. "Whereas automobile production this year represents an increase of only 11 per cent over 1936, export sales are exceeding last year by more than 30 per cent," he said. "At this rate, 1937 sales of American designed motor vehicles in 140 countries outside the U. S. may be expected to reach 650,000 units."

Prosecution Seeks To Rule Out Material On U.S. "Approval"

By Teletype
By A. M. PETTY
Staff Writer

MADISON, Oct. 5.—Trial of the so-called oil conspiracy case here is just two days old. But already the jury has been selected, the government has presented its opening statement and an important ruling by Federal Judge Patrick T. Stone, presiding, affecting the admissibility of evidence that the government "approved" defendants' activities is expected to be handed down in a few hours.

Selection of the jury proceeded without incident and was completed the first day of the trial, Oct. 4. Composed of farmers and business men generally, the jury also includes a gasoline retailer.

Because local newspapers had printed stories "prejudicial" to both sides, Judge Stone decided to lock up the jury for the duration of the trial, which he expects will last two months or longer.

At the outset, Judge Stone summarily overruled a motion to dismiss the indictments filed by Col. William J. Donovan, New York, chief defense counsel for most of the oil company defendants.

Judge Stone has also ruled that witnesses may be present in the courtroom prior to their appearance on the witness stand.

The courtroom has been packed nearly every minute of the trial, with defendants and their counsel, spectators and witnesses. About 20 newspapermen are sending detailed accounts to all parts of the country. The first day prospective jurors forced some of the crowd to stand around the wall.

Forty-six defendants were called to trial. Ten, including B. L. Majewski, Deep Rock Oil Corp., who had unsuccessfully demanded that he be tried along with the other defendants, were not brought to trial Oct. 4. Edward Karstedt, Denver, formerly vice president of Continental Oil Co., was excused when the trial opened Oct. 4. For complete list of defendants, and others excused see page 30, of this issue.

In the original indictment returned July 28, 1936, there were 58 individual defendants, 23 oil

Texas Studies Raise In Production Tax

By Telegraph

AUSTIN, Texas, Oct. 5.—The sub-committee of the house revenue and taxation committee of the Texas Legislature Oct. 4 reported details of an omnibus tax bill designed to increase state revenues. The chief money getter would be an increase in oil production tax from the present two and three-fourths cent, or per cent—whichever yields the most is the one applied—to four cents or per cent. The estimate of the sub-committee was that crude oil productions under the new rate would pay $22,862,857 annually, or $7,144,763 more than the current rate.

The omnibus bill recommends an increase in the tax on natural gas from the present three per cent of its value to four per cent.

companies and three trade journals—all charged with a conspiracy to fix artificially the tank car market for gasoline. However, when the second indictment, on which the defendants are now being tried, was returned Dec. 22, 1936, the names of R. G. A. van der Woude, New York, president of Shell Union Oil Co., and E. W. Sinclair, New York, president of Sinclair Refining Co., were dropped.

Judge Stone has given counsel for both sides until the morning of Oct. 6 to present briefs to aid him in reaching a decision on the admissibility of "evidence" that the government approved the defendants' activities in the so-called buying programs.

"I anticipate," said Judge Stone, "what a part of the defense will be — that is, that prior to expiration of the NIRA, defendants were operating under a code and therefore exempt from the Sherman anti-trust law, and that their activities since March, 1935, have simply been a continuation of what they did under the code."

The question, he said, is whether defendants were operating in strict compliance with the oil code during the three months (prior to expiration of NIRA) covered in the indictment which alleges that the "conspiracy" started in March, 1935.

The Judge's action followed a plea, at the opening of court Oct. 5, that the court issue an order against defense counsel mentioning in front of the jury anything about the government "approving" defendants' activities unless such evidence were submitted ahead of time and found to be sufficient to satisfy the judge.

Col. Donovan fought this proposal, contending that it was "astounding and novel". He said that defendants could not be compelled to present their case in advance of trial.

Government counsel took the view that their case would be irreparably prejudiced if defense counsel were permitted to go ahead and mention in front of the jury government "approval", and that the court should find that such evidence was inadmissible.

Opening Statement

Government's opening statement was started by William P. Crawford and completed by Hammond E. Chaffetz. Both covered similar ground, giving the jury some background of the oil industry and then explaining the indictment in simple language.

Winding up the afternoon session Oct. 5, Chaffetz revealed that the government is counting on William Paul Jacobi, Tulsa, of Wadhams Oil Co. (Socony-Vacuum Oil Co.), to tell from the witness stand details of the so-called Mid-Continent buying pool mentioned in the indictment.

In these "buying programs", the defendant companies, Chaffetz charged, bought up not only so-called distress gasoline but enough to remove all that the independent refiners had for sale on the open market, with the purpose of fixing the spot market price.

"One of the most amazing things we will show by evidence about this conspiracy," Chaffetz said, "is that the conspiracy was under way only a few weeks when they decided that the price was not moving up fast enough, so they met and said let's each pay one-eighth cent more. Testimony will show that the price rise was immediately reflected by the trade journals."

Earlier in the day, Crawford had told the jury that the trade journals had known the market was "rigged". Consequently, he said, they were the most guilty of all the defendants.

During the afternoon session Judge Stone announced that he would not permit any evidence to be introduced tending to show the financial status of the defendants.

This followed an objection by Donovan, supported by Judge Stone, to remarks of government counsel about "millionaires and billionaires" allegedly conspiring to raise gasoline prices to the consumer.

Scarcely had Judge Stone taken his seat on the bench when Chaffetz fired the opening gun in the spirited battle between counsel over what sort of evidence the defense would be permitted to present to the jury. The jury was not in the box during the argument.

Chaffetz said it was imperative to the government's case that the trial not drag on. To speed things up, he urged the court to bar all evidence not bearing on what the government regards as the fundamental issue—namely, whether the defendants entered into a conspiracy to raise the tank car market for gasoline.

According to government counsel, any evidence touching on the "reasonableness" of the alleged price-fixing conspiracy is irrelevant. Anticipating the defense would present evidence of some sort of government approval of their "conspiracy", Chaffetz asked the court to prevent such "evidence" being presented to the jury unless some basis is first laid.

Col. Donovan rose slowly to his feet and in deliberate tones told the court: "In all my years of court experience, I have never heard such an astounding or novel statement from the prosecution.

"It is just as if the prosecution said; 'We don't know what the defense will be, therefore the court should compel the defense to disclose what its case is before the jury is brought in,'" he added.

Judge Defines Issue

Judge Stone said the issue is the question whether the defendants engaged in a conspiracy to fix prices; if they did so, they have violated the law, he added.

The question of government approval is important, said Judge Stone, adding that he believed the court was entitled to know whether defense counsel will submit proof of approval by the Secretary of the Interior or the President and what kind of proof.

"Why should the defense", Donovan asked, "be compelled, before the trial has actually started and the jury called in, to state to the court how it shall offer proof?"

He said that the defense was prepared to offer evidence "clearly showing approval by the Secretary of the Interior, both written and oral approval."

Jumping to his feet, Chaffetz demanded to know where the government would be if defense counsel, in their opening statement, dwelt at length on the character of the "approval" allegedly given by the government to the defendants' activities.

"If they tell the jury about this 'approval' and the court finds that it does not fulfill what it regards as necessary to constitute a suspension of the anti-trust laws under the NIRA —where would the government be?", Chaffetz asked.

"If defense counsel can tell the jury three hours from now, why can't they tell the court now and let the court pass upon its sufficiency," he asked.

"They have no written ap-

Editorial in Sheboygan Newspaper On Case Is Deemed "Prejudicial"

By Teletype

MADISON, Oct. 4.—Following is the text of the editorial on the so-called oil conspiracy case, published by the Sheboygan (Wis.) Press, which Federal Judge Patrick T. Stone deemed sufficiently "prejudicial" to the case of the defendants to ask each prospective juror if he had read it. It appeared under the caption, "Lavish Spending in Madison":

"Oil money will be spent most lavishly in Madison during the next two months while the federal government prosecutes the cases of 18 large oil companies, six subsidiaries, three trade publications and 47 oil executives.

"Already thousands of feet of office room have been contracted for and the elite of the oil industry will occupy spacious homes that have been leased to house families that are coming to Madison, not alone for the trial but with a view of keeping up their social standards. Some people are giving up their homes temporarily renting them out at enormous sums.

"How much better it would be if these so-called oil barons would come to Madison and mingle with the common herd, instead of throwing money to the four winds. The humble jurors who will participate in the trial of these cases will find the atmosphere anything but what they have experienced in the past. The humble homes from which they have been drawn will be a poor substitute for what they are going to see on all sides as they come to Madison. They will see wealth, lavish spending and an atmosphere created that will be entirely foreign to what they have witnessed in the past. They will see an 'oil boom' in Madison and the spending of these huge sums of money cannot help but create distrust in some sections. Spectators will get a fairly good impression of what it means for the government to proceed against such a powerful industry.

"Matched against the talent of the United States attorney general's office will be half a hundred of the very best lawyers that the American Bar association produces. Step by step the government will find every technicality known to the law utilized. This is what money and power makes possible, but it is what the government of the people invites when it proceeds against such powerful interests.

"One point will stand out clearly throughout this trial—that justice is sometimes delayed through technicalities that confuse even the courts. The best legal brains in the United States will raise every known objection to the end that an encumbered record may be the means of winning their point."

proval," Chaffetz shouted. A ripple of laughter swept the courtroom. Judge Stone admonished everyone present that "this is a serious case and not a laughing matter."

Chaffetz disagreed with the judge in his view that evidence for the defendants on the question of "approval" could go to the jury.

But Judge Stone brushed aside the objection, stating; "When an officer of this court (defense counsel) says he has written approval, I accept his word for it."

Then Judge Stone asked Col. Donovan what was the nature of the "written approval".

Col. Donovan started his reply, saying "we cannot be compelled to submit ————". Then he paused as Chaffetz started to jump up in front of him.

"Mr. Chaffetz, please sit there quietly and let me answer the question," Donovan said. Turning again to the judge, Donovan said:

"This is a criminal case, to be tried by a jury. The government could have brought a civil proceeding. But they didn't; instead they brought a criminal action. So, they must be bound by the rules of criminal procedure. The essential element in the case is intent. For that reason questions of instigation, inducement and approval are relevant".

Judge Stone interposed to say, "if this affair was never approved legally under the NIRA; it could not be legally approved thereafter."

Standing on Marne

Deliberately, Donovan again rose to his feet and replied: "For a year we have tried to go along with this court, yielding. But we are standing right on our Marne now; we may as well make our fight right here".

The judge offered a recess, if the government's move had taken the defense by surprise. But Donovan declined.

"It is no surprise," he added. "For a year now it has been clear that the government is not only preparing its own case but attempting to delimit the defendants' case."

Chaffetz charged that defense counsel's purpose was to proceed with presentation of evidence of "approval" before the jury, even though counsel has no basis at this time for what the court regards as necessary to prove such approval by the government.

Crawford Interrupts

"Why let the case go that far?" asked William P. Crawford, another government counsel. "The time to settle whether the defense has this evidence is right now — before the government's case is prejudiced."

Donovan shot back at government counsel with the statement that, without a change in the Constitution, the defendants in a criminal trial cannot be required to present their case in advance of trial.

The proper procedure, according to Donovan, is to allow the defense to make its statement and present its evidence to the jury, and if government counsel takes exception they can ask the court to strike "irrelevant" matter from the record. He reiterated that the defense was "asking no quarter from the prosecution."

"Your Honor, we know, will not order the defense to present their case in advance of trial—something that no defense in any other case has been asked to do," Donovan concluded.

This brought John Henry Lewin, the third government attorney to his feet.

Lewin Takes Hand

"If they have the evidence, let them show it now," he demanded. "This is nothing more than an attempt to force a back-door entrance for their half-baked evidence to get to the jury."

Judge Stone reserved decision on this point until counsel for both sides could present to him their views of what was necessary, under the NIRA, to constitute government approval and suspend the anti-trust laws for some agreement or other joint action by members of an industry. He then declared a 15-minute recess.

At the end of the recess Judge Stone re-entered the courtroom, and, with the entry of the jury at 11:14 a.m., trial of the case actually got under way.

Crawford, chief government counsel, began the opening statement of the government's case with a simply-worded explanation of the charges in the indictment. In doing so, he brought out many A.B.C. details of the oil industry and the marketing of its products for the benefit of the jury which, except for two or three, has little background knowledge of the industry and how it operates. He explained how contracts are based on spot market prices as reported in the trade journals named as defendants in the case, and told about the alleged conspiracy to raise the spot market price.

"You must not expect," said Crawford to the jury, "that we are going to produce written contracts between the defendants to enter into this criminal scheme. But we will unfold the picture of how the master minds sowed the seeds in the minds of others to form this conspiracy to raise spot prices."

"For example, East Texas refiners," he continued, "were selling gasoline at 3 cents a gallon to jobbers and the jobbers were getting a fair margin of profit. This price level was unsatisfactory to the major oil companies. So they got together with the independent refiners and raised the spot price, translating it, through the trade journals, into increased prices in the jobbers' contracts."

E. Texas Refiners Organized

"The major companies organized the independent refiners of East Texas," he added. "Then they began buying gasoline from them at 4 cents a gallon. They didn't buy because they needed it—indeed, they had already more than they needed."

"Then the trade journals looked at the spot market and found the price 4 cents a gallon and raised their prices to 4 cents. The next day the jobber would pay 4 cents a gallon under his contract instead of 3 cents. That was a rigged price."

He named as the "mastermind," who allegedly told the others what to do and called meetings and laid down the plan, Charles E. Arnott, now vice president of Socony-Vacuum Oil Co., and one-time chairman of the marketing sub-committee under the oil code.

Others, whose names will be brought out in the trial, Crawford told the jury, are Neil Buckley, Cities Service Oil Co., who allegedly formed an association of East Texas refiners to co-operate with the gasoline "buying program" of the major oil companies, and William Paul Jacobi, Wadhams Oil Co., (Socony-Vacuum), who allegedly functioned in a similar capacity in the so-called Mid-Continent buying program.

Crawford got down to a personal basis with the jury, stating how the "conspiracy" had allegedly raised the price of gasoline to consumers such as "you and I."

"These tremendous aggregations of great wealth operating together conspired, secretly, to raise the spot market price, which also raised prices to the consumer," Crawford charged. Judge Stone recessed the trial at 12:05 to resume again at 2 p.m.

* * *

(Preliminaries of the trial are covered in story on following page.)

Your "Eyes and Ears" at Madison

Let National Petroleum News trained, experienced, editorial staff writers bring you the account, week by week, of the happenings in the dramatic oil conspiracy trial at Madison, Wis. It will be the only oil publication to report the trial throughout, by its own staff writers.

To better serve in bringing you each week, accurately and up-to-the-minute, what is happening to the 23 oil companies and their officials on trial there, National Petroleum News has installed its own editorial office in Madison. It will use fast teletype service to transmit to its publication headquarters the news—in just the words as written by its own staff writers on duty there.

The staff writer now in charge of N.P.N.'s news gathering at Madison is A. M. Petty, at the head of our Washington News Bureau, who has followed the case since its development. Other of our staff writers, familiar with the oil markets, will report the trial when market transactions figure in the testimony.

Read the news—fresh - impartial - concise - straight from the courtroom in Madison—each week—in National Petroleum News.

Jurors Named On First Day

The trial opened on the stroke of ten o'clock the morning of Oct. 4, with defendants and their lawyers, government counsel, newspapermen and spectators jamming the courtroom.

The first business, after Judge Stone had read the title of the case—U. S. vs. Standard Oil Co. (Indiana) et al.—was another attempt on behalf of B. L. Majewski, Chicago, of Deep Rock Oil Co., to be tried along with the 46 other individual defendants called to trial Oct. 4.

But the judge overruled Col. Donovan's motion, even though the chief defense counsel offered to withdraw Majewski's plea in bar. So, the Deep Rock official will not be brought to trial at this time.

Nine other individual defendants, for one reason or another, also will not be called to trial at present, the judge announced. One of them, Keith Fanshier, petroleum editor of the Chicago Journal of Commerce, has been subpoenaed as a government witness. Four officials of the Gulf Oil Corp., will not be brought to trial now, because their fight against removal to Madison is being carried to appellate courts.

The Gulf officials are: J. F. Drake, Pittsburgh, president, Wm. V. Hartmann, Pittsburgh, vice president in charge of marketing, H. C. Meyer, Pittsburgh, general sales manager, and O. H. Carlisle, Houston, division manager.

Motions To Dismiss

Motions to dismiss the indictments were filed by counsel for the various defendants, but were summarily overruled by Judge Stone.

The next point to be settled was whether the defendants would be required to be in the courtroom for the duration of the trial. Judge Stone stated that, while the defendants could waive their right to be present, he would like to have them all in the courtroom throughout the trial. However, if any defendant has an important reason for absenting himself, he may ask the Judge for permission to do so, the court said.

In selecting the jury, the government was allowed six peremptory challenges and the defense, ten. A peremptory challenge is the right to strike the name of a prospective juror from the panel without stating a cause for disqualification.

Lock Up Jury

In announcing his decision to lock up the jury for the duration of the trial, Judge Stone said that articles which have appeared to date in some newspapers, have "prejudiced" the case for both sides.

Col. Donovan pointed out that it will require "a good many weeks" for the defendants to present their side of the case and that, as the trial dragged on, resentment against the defendants might be aroused among the jury if they were locked up and not permitted to return to their homes over week-ends.

However, Judge Stone overruled Col. Donovan, declaring that there could not be a fair and impartial trial if the jurors were permitted to read the newspapers. "This case is not going to be tried in the newspapers but on the facts brought out in this court," said the jurist.

"When we reach the end of this trial I want to feel in my mind that the decision of the jury is based on facts brought out in court and not influenced by anything outside the courtroom," he added.

Col. Donovan directed the attention of the judge to an editorial published in the Sheboygan, Wis., Press and reprinted in the Madison Capital-Times, which the defense counsel felt might have "prejudiced" the case against the defendants in the minds of some prospective jurors. Judge Stone promised to ask the jurors if they had read it. He did ask them, but none admitted reading it.

Then began the tedious task of selecting the jury of 12, with

(*Continued on page 22*)

Majewski Denied Immediate Trial

MADISON, Wis., Oct. 4. — Federal Judge Patrick T. Stone of U. S. Court for Western Wisconsin denied a motion today on behalf of Bernard L. Majewski of Chicago, vice president of Deep Rock Oil Corp., asking that he be tried with other oil defendants named in the Standard Oil Co. (Indiana) indictment.

The motion was made by Col. William J. Donovan, chief of defense counsel of 46 oil men, 23 companies and three trade publications charged with participating in a conspiracy to raise the price of gasoline. The motion started proceedings in the oil trial expected to last 3 months. After Judge Stone's denial of the motion, Donovan renewed Majewski's plea in bar in which the Deep Rock official asked immunity from prosecution on the grounds he was an unwilling government witness before the grand jury.

In denying the motion, the court upheld the contention of John H. Lewin, government counsel, that the prosecution has the right to determine when the various defendants are to be brought to trial and whether they will be tried separately or jointly. The court held that the prosecution would require some time to prepare its case against Majewski if he were to be tried before or with the other defendants at this time.

Middle Aged, Rural Jurymen Will Try Oil Firms at Madison

A middle-aged jury, including a gasoline retailer and five farmers, will try the so-called oil conspiracy case.

Besides the five farmers, one of them retired, on the jury of twelve who will try the case, the two alternates are farmers —one a fox farm operator. The alternates, that is, jurors 13 and 14, will sit through the trial but will have no hand in the final decision unless one of the original 12 should become incapacitated to serve.

At least one of the jurors is interested in the oil business now—and two others disclosed that they had sold gasoline and oil in the past.

Harry Fullert, 42, of Marshall, now operates a garage and filling station. He said he has been buying gasoline and oil for 15 years from Valvoline Oil Co., and that a "pleasant relationship" had always existed between him and the oil company.

Age of the jurors ranges from 30 to 63 years, with the average age somewhere between 45 and 50, nearer 50, perhaps. Seven jurors are between 50 and 60, three are in their 40's, two are in 30-40 age group, and two are 60 years or more group.

Youngest Juror

Youngest of the jurors is Charles Noonan, of Union county, who is in his early 30's. He now operates a truck for a living but said that for six years he operated a garage and sold gasoline and oil bought from Standard Oil Co. of Indiana, one of the defendants in the case. He said that he had had no trouble in his dealings with the oil company.

Hiram Nelson, 63, Stoughton, is the oldest juror. Like other prospective jurors called who were over 60 years of age, Nelson was offered an opportunity to withdraw but preferred to remain on the panel. He is a retired official of the American Telephone & Telegraph Co., and said he owns some stock in that company.

Another juror with an oil background, although slight, is Joseph Kalscheur, 36, of Klevenville, a carpenter who declared he once worked for two months as an attendant in a filling station selling gasoline and oil bought from Standard of Indiana. He said his relations with the oil company were "pleasant."

Besides the farmers and the fox farm operator, there were selected for the jury a bridge foreman, voluntarily retired nine years ago from service with the Chicago, Milwaukee, St. Paul & Pacific Railroad Co., who admitted no business experience; an operator of a store selling general merchandise for the last 12 years, and a real estate dealer.

List of Jurors Selected for the Conspiracy Trial, All Living in the Western Judicial District of Wisconsin

Name	Age	Home	Occupation
Original Twelve			
Frank Brechler	52	Marathon	Retired railroad bridge foreman.
Charles Noonan	35	Union County	Truck operator, formerly operated a garage and sold gasoline and oil.
Hiram Nelson	63	Stoughton	Retired official of American Telephone & Telegraph Co.
Phillip Hanson	50	Blue River	Farmer.
Joseph Kalscheur	36	Klevenville	Carpenter.
S. W. Grenzow	55	Monticello	Operator of general store.
Harry Fullert	42	Marshall	Operator of garage and filling station.
Sam McGaw	53	Madison	Farmer.
E. N. Slattery	55	Rudolph	Farmer.
Neal Larson	55	Deerfield	Retired farmer.
Charles Burnham	45	Lone Rock	Farmer.
James Mullen	53	Spring Green	Real estate dealer.
Alternates			
Earl Hibbard	60	Knowlton	Farmer.
Clifford Huber	41	Brooks	Operator of fox farm.

Surplus Profits Tax Independent Producers' Topic

N. P. N. News Bureau

TULSA, Oct. 4.—An amendment of the tax law, to eliminate the confiscatory taxation of undistributed profits, is listed for discussion on the tentative program of the Independent Petroleum Assn. of America, at its eighth annual meeting at Houston, Oct. 13, 14, 15 and 16.

In addition to the undistributed profits tax, a subject which has held the attention of independent marketers for the past few months, the program includes a discussion of many other national problems involving the petroleum industry.

Among these are: the necessity and justice of the 27.5 per cent depletion allowance to producing companies in their income tax returns; unnecessary and excessive drilling; balancing of crude oil supply with demand; the present storage situation; exemption of oil royalty companies from improper classification in the tax law with personal holding companies organized to evade taxes; increased imports of foreign petroleum products, and plans for the more extended use of domestic asphalt.

Ickes To Speak

The principal speaker at the annual banquet Oct. 15 will be Harold L. Ickes, Secretary of the Interior. The banquet will be followed by a dance.

The first day of the convention will be devoted to meetings of various standing committees. The first general session will begin at 10 a.m., Thursday, Oct. 14, in the main ballroom of the Rice hotel. Following President Charles F. Roeser's address, Russell B. Brown, general counsel, will discuss "National Legislative Trends in the Petroleum Industry."

At the Thursday afternoon session J. D. Collett of Fort Worth, Tex., will discuss "Pollution and Waste Disposal Measures."

The morning session Oct. 15 will be given over to committee reports and a discussion of the 27.5 per cent depletion clause in the federal revenue bill.

Wirt Franklin, former president of the association, will discuss at the afternoon session "The Relation of Imports to Domestic Production." His talk will be followed by reports of the nominating committee.

The morning session Oct. 16 will include a meeting of the board of directors and the election of officers, followed by a report of the budget and finance committee, of which N. T. Gilbert, Tulsa, is chairman.

The association has reserved 1500 seats at Rice Field for the Tulsa University-Rice Institute football game Oct. 16.

Mich. Assn. Sues Premium Station

By Staff Writer

DETROIT, Oct. 4. — After weeks of preparation and investigation to build a legal offensive with which to attack certain alleged violators of Michigan's new fair trade practice law, the Retail Gasoline Dealers Assn. of Michigan filed an injunction suit Sept. 29 in County Circuit Court here against Victor J. Miller, in an effort to restrain him from giving premiums with the sale of petroleum products at his station.

This is the first legal action taken by the association to bring about compliance with the new law, and some believe the case will develop into a test of the law's constitutionality.

Pending the outcome of this case, the association is holding off on other cases against other premium givers on which it is understood to have obtained evidence of alleged violation of the fair trade law.

Miller, the defendant in the current injunction suit, has 15 days in which to answer the charges brought against him. Following his action, the association also has 15 days in which to reply.

Drop Cities Service Suit

NEW YORK, Oct. 4.—An accounting suit for $18,000,000 against the Cities Service Co., and its president Henry L. Doherty and 20 other individual and corporate defendants was stricken from the court calendar here Sept. 30 by Supreme Court Justice McLaughlin. The plaintiff and his attorney failed to appear when the suit was called for trial. The suit was brought by Morton Marks, a stockholder, and charged loss to stockholders through manipulation of Cities Service stock.

A somewhat similar stockholders' suit was up in federal court when Doherty offered to settle for $1,250,000. This offer was accepted and the settlement was later ratified by stockholders of the company.

Ill. Jobbers File 6.6 Pound Complaint, 237 Firms Listed

N. P. N. News Bureau

WASHINGTON, Oct. 4.—Another association of independent petroleum marketers has filed a complaint with Interstate Commerce Commission against the estimated weight of 6.6 pounds per gallon upon which railroads base their charges for transportation of gasoline.

The latest association to file is the Illinois Petroleum Marketers' Assn., which lists as co-complainants 237 oil marketing companies in Illinois, Iowa, Ohio, Tennessee and Missouri.

The complaint covers only gasoline, natural gasoline, casinghead gasoline, and blended gasolines, whereas some of the other complaints and intervention petitions already filed have applied the same allegations to the 6.6 pound weight as it concerns shipments of other light petroleum products.

Application of the weight estimate to their shipments of gasoline, the complainants charge, "has resulted and is resulting in payment by complainants of excessive and unlawful charges." They also say they are paying "and in the past have paid and borne transportation charges on property not actually transported by defendants."

162 Railroads Named

The complaint names as defendants a long list of railroads, 162 in number, engaged in interstate transportation between points in Oklahoma, Texas, Arkansas, Missouri, Kansas, Louisiana, Wyoming, Illinois, Ohio, Pennsylvania, Indiana and Michigan, and points in Illinois, Missouri, Indiana, Iowa and Wisconsin.

The complainants contend the 6.6 pounds per gallon weight estimate, being higher than actual weight of products shipped, results in prejudice against complainants and preference of shippers of other commodities, on which the rails apply transportation charges based "upon actual weight or estimated weights not in excess of actual weights."

New charges or estimated weights such as the commission "may deem reasonable" are sought by the complainants, in addition to reparation for alleged overcharges resulting from the use of the weight estimate in the past.

At the same time, two more interventions have been granted by the Interstate Commerce Commission on the case filed some weeks ago by the Indiana Independent Petroleum Assn., which makes similar charges against the 6.6 pound estimate.

The intervenors are Cities Service Oil Co., whose petition asks that the commission award it the "same relief and remedy" as granted the complainants (in the way of reparation), should the commission find the rates and charges unlawful, as alleged; and Gulf Refining Co., whose petition asks no reparation, and does not adopt the allegations of the complaint, but only states that the "issues in this proceeding are of considerable consequence to your petitioner and would of necessity affect its business."

Ethyl Margin Reduced In Washington Bid

WASHINGTON, Oct. 1.—The Standard Oil Co. of New Jersey has been awarded the contract for supplying the motor fuel requirements of the federal departments by tank wagon delivery in the District of Columbia during the October-December quarter, at a maximum price of 7.74 cents for V-68 (regular) and 9.24 cents for V-75 (premium), the Treasury Procurement Division announced today.

Under the contract, the Jersey Standard will supply "Essolene" for V-68 and "Esso" for V-75. Posted price basis will be posted consumer tank car less 0.26 cents.

Ordinarily, the differential between the price for "regular" and Ethyl gasoline is 2 cents a gallon, but in the Standard's bid it is narrowed to 1.5 cents. Commenting on the differential, the company pointed out that the Shell-Union Oil Co. had obtained the District of Columbia contract for the July-September quarter at the same prices and with the same spread. The 1.5-cent spread is given in the district to commercial consumers and wholesale dealers, Standard stated. The margin between "regular" and Ethyl at service stations remains at 2-cents a gallon.

The Jersey company also won the contract for tank wagon delivery of G-101A in the District of Columbia, at commercial tank car less 0.36 cents with a maximum price of 7.65 cents.

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We Climb the Wooden Stairs To the Dreams of the Past

By WARREN C. PLATT, Editor

MADISON, Wis., Oct. 3.—There are some stories that always start with the ticking of the clock, and so does this, even though I offer it to you as an editorial in an industrial paper. The clock is ticking in a midnight silence such as I have not heard in years. Its beat is slow and calming, in fact slowing a bit every hour, as I discovered today. At my side is a warming coal fire and before me this typewriter on the stool of the departed landlady's scrolled dressing table.

The two lawyers who are shivvying destiny in my behalf are down town with a hundred more of their kind, threshing over the details of tomorrow's opening of the government's big conspiracy suit against a lot of oil companies and two publishers.

My other companions in this furnished home we have rented are out in the crisp night air for a walk. The picture lacks a cat. I had designs on a kitten that followed me part way home tonight but I feared it might disappoint some neighborhood kid and also I had compassion on the landlady's rugs.

With all this stage setting something should now arrive in the way of a story. But all it is, is the realization how utterly helpless, alone and useless, is a principal in a suit of this kind. Only the lawyers count, it seems. For the first time in all the years since I left a much smaller college town than this, I have nothing to do. I am at rest. Truly so. The jangle of that business traffic in which we are all so absorbingly engulfed, is somewhere else, seemingly as far away as were the street cars of a far away city from that small town of yesterday.

For the first time in all these years since I started "on my own," decisions are being made for me. My mentors do not even bother for my advice. My daily affairs, my comings and goings to town, are all arranged for me, some by the court, some by the attorneys and my personal living by the man who runs this house.

Wherever I go I find men working for me or for others of my kind here. Lawyers and their clerks and stenographers work far into the night; but they are not interested in me. I and the other defendants are smiled at but bade to be on our way as there are things to do. There are conferences, but somehow we hardly seem to be in them, not even on the edge. Meetings go on to which we are not invited and of which we are given only bits of information, much like the eminent medical authorities who hold whispered conference outside the hospital door and then tell the patient what they think best.

This afternoon I climbed a flight of wooden outside stairs to our temporary offices here, all that were vacant in this town. Down a dark dusty hall I found our offices but occupied by the two attorneys. I stood on first one foot and then another while they argued. I fiddled around for a few minutes and departed, plainly not wanted.

I didn't quite get what those wooden steps reminded me of as I went down them and around to the hotel where another oil man was unloading his baggage after a tiring ride from Oklahoma. Had he brought his fishing rods? Like a kid he grinned and admitted it, so we made a date for the next week end.

At the corner I met another one usually energetic but then gazing into the drug store window more idly than he has looked at anything in the last 25 years. He was admiring some teddy bears, he said, and wondering how they would go with the wild animals on his ranch. Yes, he had thirteen rooms full of lawyers and associates but for some reason he hadn't much to do so he stood and watched the stuffed teddy bears.

So I drove home with no business to do and no one to do it with. Then it came to me that climbing those old wooden stairs was like climbing to the editorial sanctum of the country newspaper office where I broke in, back in the peace and quiet of the small town where I was born and raised, where the sun seemed to shine most of the time and where all decisions were made for me.

My fishing companion for next week-end fits into the picture. He too comes from a small town way up in Maine. The man on the corner studying the drug store teddy bears probably hasn't rested, except in the custody of a doctor, since he left the cross roads Iowa town where he was born. But he is resting now.

I wouldn't be much surprised that, with all the vexations of the trial the 46 of us who have been singled out by our government will rather enjoy the stay here where our lives, for once in a score of years and more, are governed by others just as in the small towns from which I guess practically all of us came.

The newspaper boys write of our "luxurious" homes and offices here. That word "luxurious" fits in with the popular idea of what the oil industry is made of, but it does not fit the places where we all came from. These offices of ours here are more like the first ones we ever saw, or where we started. The homes are better, yes a whole lot better but maybe after all these years of work we are entitled to a few years in them. However comfortable these homes we occupy here may be, we have had to pack so many men in them through lack of space in the town, that they are more like barracks than homes. Four and five men to a single bathroom of a morning is not quite one's idea of "luxury."

And our offices,—well take ours for instance. Furniture is scarce and second hand office equipment is now practically impossible to get. We have rented a table and a few chairs but ordered some desks shipped up from Cleveland. Finally, in a little second hand shop we found a dining room table of much past elegance but now hardly worth the $6 we paid for it. However, its delicate Sheraton legs rest their feet quite ladylike and mincingly on our bare office floor, laid probably not many years after the Civil War. My chief counsel's top coat was draped over a refuse box and the dirty floor today. We will get him a nail tomorrow.

This sudden letdown after the rush of all these years and of these last few days, is surprising and leaves you at loose ends. Just as this alleged editorial is getting one no where. There are 46 of us sitting around different homes and hotels and apartments in this town tonight while our counsel are literally in secret session from us thrashing over what they will do with us and for us. It's their meet-

NOMA Banquet To Honor Author Of Marketing Divorcement Bill

N. P. N. News Bureau

WASHINGTON, Oct. 4. — Another "first time" has been added to the convention program for the National Oil Marketers' Assn. in Chicago Oct. 12-14, Secretary Paul E. Hadlick announced today at the association's Washington office.

The coming meeting will be the first time a banquet has ever been held in connection with the N.O.M.A. convention. The banquet will be held Oct. 13, at the Stevens Hotel, where all convention sessions will take place.

Previously, Hadlick had announced that a fuel oil session would be held at the convention —for the first time.

The banquet will be in honor of Congressman Fred Biermann, of Iowa, author of the bill to divorce marketing from the other branches of the oil industry, and his address in explanation of his bill has been moved from the morning session to the banquet program.

All members of N.O.M.A. and visitors at the convention are invited to attend the banquet, according to Hadlick. Henry M. Wilson, vice-president of Cushman-Wilson Oil Co., Des Moines, Ia., will be toastmaster.

Leod D. Becker, publisher of Fuel Oil Journal, and Milton A. Powers, chairman of an American Society for Testing Materials technical committee on fuel oils, are scheduled to speak at the fuel oil session.

Travel Exhibit

In addition to the convention sessions, a large and varied trade exhibit, featuring the new developments in equipment and services for the jobber, will be conducted all three days of the convention in a section of the hotel adjoining the convention hall. A list of exhibitors who have taken space in the exhibit, is appended at the end of this article.

The convention sessions will be opened the afternoon of Oct. 12, by M. B. Whiting, Clifton Forge, Va., president of N. O. M. A.

Roy R. Fisher, Detroit, vice president of the association, will preside at the morning session Oct. 13, when the secretary will give his annual report and there will be an address by Clarence T. Schock, Schock Independent Oil Co., Mt. Joy, Pa., as well as an address by George W. Doonan, of the Social Security Board, on the topic "The Social Security Act."

The morning session Oct. 14 will be devoted to the business of the organization, including discussion of the Biermann bill and other legislation—enacted and proposed. Plans and policies for the coming year, both legislative and otherwise, will be determined.

Hadlick says that practically all state oil marketing associations are co-operating with his association in an effort to get their members to attend the convention and special cars, special trips, and other methods of assuring attendance are being considered.

Exhibitors who have taken space in the exhibit hall at the convention hall entrance include:

Aldrich Co., Peoria, Ill.; American Can Co., Chicago; S. F. Bowser & Co., Inc., Ft. Wayne, Ind.; Butler Mfg. Co., Kansas City; Canfield Oil Co., Cleveland; Chek Chart Corp., Chicago; Chevrolet Motor Co., Detroit; Continental Can Co., New York; Crown Can Co., Philadelphia; Dixie Interstate, Hillsdale, Mich.; E. Edelmann & Co., Chicago; Erie Meter Systems, Inc., Erie, Pa.; Fuel Oil Journal, New York; Irving-Cloud Publishing Co. (Super Service Station), Chicago; Lubrication and Maintenance, Chicago; Master Meter Duplicator Division, John Wood Mfg. Co., Richmond Hill, Long Island, N. Y.; Morrison Bros., Dubuque, Ia.; NATIONAL PETROLEUM NEWS, Cleveland; Oildom Publishing Co., Bayonne, N. Y.; Petroleum Age, Chicago; Petroleum Daily, Dallas, Tex.; Pittsburgh Equitable Meter Co., Pittsburgh; *Platt's Oilgram*, Cleveland; Quaker State Oil Refining Corp., Oil City, Pa.; Sinclair Refining Co., New York, and Social Security Board, Region VI, Chicago.

La.-Ark. Meeting Date Changed

TULSA, Oct. 4.—The one-day annual membership meeting of the Louisiana-Arkansas Division of the Mid-Continent Oil & Gas Assn., has been changed to Oct. 26, rather than Oct. 27, as at first planned, according to A. R. Campbell, secretary. The meeting will be held in the association headquarters in the Slattery Bldg., Shreveport, La.

Editorial—*Continued*

ing, not ours. Maybe, if we wait up for them late enough tonight, they will tell us something about it. Maybe they won't. It's their day on the stage.

They are meeting in a guarded chamber in the basement of the town's biggest busted bank. The newspapers have called it the "Oil Barons' Marble Hall." When I saw it yesterday its marble was cheap and tawdry, the kind put on with a trowel, with the fine lines of Italian marble stroked on by a brush. In all the clutter of wallboard office partitions temporarily thrown up in the banking quarters to make offices for the attorneys, even the bronze fixtures looked cheap and gildy.

But I suppose, if I went down there tonight and hung around the outside, an unwanted visitor, even a stranger to its busy cubby holes, all the pomposity of that once dignified, if garish, interior, probably would look like the marble hall of the wealthy barons of that small Ohio college town did to the kid of yesterday. Just as a flight of wooden stairs once seemed to him to lead to the greatest job of the greatest profession in the world. And I wonder how many of the other 46, waiting for their legal betters to settle their fate, may not also, in their memory's eye, go back and find that that plaster monstrosity of the bank decorator's art, is built of the marble of yesterday's hopes.

P.S. I can't even write an editorial any more without the lawyers deciding whether it may run, but maybe, bad as it is, they will say this one is too far from their legal maelstrom to be of any effect and let it be published.

Engineer's Mind Focused on Reservoir, 25 Years Ago on Individual Well

N. P. N. News Bureau

LOS ANGELES, Oct. 2.—The necessity for heating most crude oil emulsions during treatment to meet pipeline specifications was declared to provide a profitable setting for the application of efficient heat exchange equipment, R. W. French, Continental Oil Co., set forth in a paper presented before the meeting Oct. 1 of the Petroleum Division in Los Angeles of the American Institute of Mining and Metallurgical Engineers.

The speaker said use of a direct-gas-fired heater of the pipe still type, and the proper exchange of heat between emulsion, waste water, clean oil, exhaust steam, and cooling water may achieve considerable fuel economy as well as more efficient operation.

A record gathering of members and visitors heard reports on recent developments in the comparatively new fields of Santa Maria, Wilmington, El Segundo and Ten Sections, during the morning session, which was presided over by E. K. Parks, Standard Oil Co. of California.

Of particular interest was the account of activity in Ten Sections, discovered by Shell Oil Co. in the floor of the San Joaquin Valley, about ten miles southwest of Bakersfield, and about half-way between Bakersfield and the easterly flank of the Midway-Sunset uplift. The field was the first successful result of geophysical prospecting in this state.

Seven wells have been completed with initial potentials ranging from 1535 to 3865 barrels daily of clean oil, providing a productive area approximately one mile wide and one and one-half miles long. Shell's production policy has been to curtail all wells to approximately 25 per cent of their potentials. The company controls all indicated productive acreage in the field.

Looks Into Future

Stanley C. Herold, consulting engineer, spoke on a "Quarter Century of Progress in Petroleum Engineering Concepts." He said 25 years ago the oil industry confined its attention to the well, whereas the reservoir which supplies the well is now receiving its consideration.

Research and education in petroleum engineering were declared to have undergone modifications and, while today the industry's position is not entirely satisfactory the speaker thought greater additional progress would be made in the next quarter century. He said petroleum engineering offers an opportunity to young men of studious mind and proper training in the physical sciences — geology, physics, chemistry, and mathematics.

Crude Evaluation and Plant Corrosion Discussed at Refiners' Group Meeting

By Teletype
N. P. N. News Bureau

TULSA, Oct. 5.—Mid-Continent refiners still are trying to get to the bottom of the corrosion problem which in the past year or two, has bobbed up with devastating suddenness at a number of plants in the more settled production areas.

That was demonstrated definitely here Oct. 5 at the second of the series of regional technical meetings being sponsored, for plantmen, by the manufacturing committee of the Western Petroleum Refiners Assn.

No sooner had Boyd Guthrie, associate chemist at the U. S. Bureau of Mines experiment station at Bartlesville, Oka., finished his description of the recently completed expansion program at that station and asked for projects suggestions, than this matter of corrosion was brought up for discussion.

Emby Kaye, vice president of Skelly Oil Co., chairman of the manufacturing committee and of the meeting, suggested the Bureau of Mines make a detailed study of the problem. Many individual studies had been made by oil companies, he said, and much of the preliminary work accordingly can be eliminated by obtaining and correlating the results of that work. What is needed, he added, was not so much practical ways to offset the corrosion after it has suddenly appeared and started to wreck equipment at a costly rate, but methods of preventing even the first appearance of more than normal corrosion.

Audience Affirms

While Mr. Kaye led the discussion the affirmative nods of the score or more of plant men present indicated that he was voicing their sentiments.

Guthrie's paper outlined in considerable detail the work that has been done to enlarge the Bartlesville station and to make it one of the most complete oil laboratories in the world. He told of the work done on a number of projects in recent years and outlined in a general way plans for the near future. The new building of the Petroleum Experiment station is to be dedicated Oct. 19 and 20.

Following Guthrie's paper, the subjects of crude evaluation and diesel fuel specifications were taken up.

A detailed method for laboratory evaluation of crude petroleum was outlined by C. W. Berger, chief chemist for the Globe Oil & Refining Co., at its McPherson, Kans., refinery.

Berger stated at the outset that his paper proposed to discuss laboratory apparatus and methods which, though simple, have been found to give satisfactory information, and with the least amount of lost motion.

The examination of crude oil, Berger said, naturally divides itself into several steps, preliminary tests, including physical characteristics and chemical tests run on the crude itself, the topping distillation, various means of handling the topped crude, analysis of all cuts or blends of cuts, tabulated evaluation of all cuts from whatever source, and a recapitulation showing how the crude may be divided according to one or more established schemes of refining.

Evaluating Crude Oils

He explained an easy method for a tabulated evaluation of a crude oil. "Probably the easiest method for calculation is based on an arbitrary assumption," he said, "that the volume of the original crude taken for analysis was 100 barrels, or 100 gallons or 100 c.c.; in other words a unit volume measurement numerically equivalent to the original 100 per cent. The amounts of straight run overhead cuts taken from the crudes are simple percentages to be subtracted from the 100 per cent of the original crude, leaving a percentage, less than 100, which represents the topped crude.

"This may be conveniently considered in terms of barrels, say 60 barrels of topped crude from a crude having 40 per cent of straight run products overhead. Now the 60 barrels mentioned then becomes the intake for, for example, the cracking operation, but is, for this operation, 100 per cent of the intake.

"Cuts derived from this topped crude intake are tabulated as simple percentages of the 100 per cent intake on one side of the schedule, and recorded in terms of barrels based on the original 100 barrels of crude oil on the other, by the simple expedient of dividing the cut percentages by the barrels of intake; in the case suggested, 60 barrels. Thus, all through the evaluation, one side of the tabulation shows cut percentages as barrels based on the original 100 barrels of crude, and since we started with a volume of crude numerically equivalent to its initial percentage, the barrel figures for each cut are actually accurate volume percentages without further calculation, and can be transferred, as such, to the recapitulation which shows the break-up of the crude."

In summing up his discussion on "The Reasoning Behind Diesel Fuel Specifications," T. B. Rendell, director of engine research laboratories at Shell Petroleum Corp.'s Wood River, Ill., plant, listed five major fuel specification requirements. They were:

(1) Suitable viscosity limits to ensure proper handling of the fuel on its passage to the combustion chamber.

(2) Suitable pourpoint limits again to ensure that the engine's pumps can handle the fuel efficiently.

(3) Suitable limits for cleanliness as shown by specifications for b. s. & w. and ash content.

(4) Suitable limits for ignition quality to ensure adequate control of the first state of combustion.

(5) Suitable limits for volatility as expressed by the Conradson carbon number or other suitable volatility index to be developed.

Two Basic Problems

In presenting his reasons for the five major fuel specifications, Rendell said that, "Now broadly speaking in any fuel specification we have two basic problems to consider. One is the problem of handling the fuel and dispatching the fuel from the refiner's supply tanks to the final fuel valve which admits the fuel at the proper time and in the proper form of spray to the combustion chamber.

"The second problem is to supply a fuel at this valve which will burn completely in the combustion chamber without objectionable exhaust smell or leaving objectionable deposits which will eventually result in destroying the 'tune' or the mechanical adjustments of the engine thus destroying its mechanical efficiency."

In discussing the first part of the problem Rendell pointed out the disadvantages of both a fuel with a low viscosity and a fuel with a high viscosity. "Fortunately, in the case of straight distillate fuels with a viscosity below 50 seconds Saybolt Universal at 100 degrees F.," he explained, "the differences are small enough to be ignored in most well designed combustion chambers. However, in the case of the higher viscosity fuels, particularly those containing fairly large amounts of residual fuel, the beginning of injection is sometimes delayed and the determination of the end of injection is not always positive. This causes dribbling, which prolongs the introduction of the fuel far down the combustion stroke and usually results in coking or carbonizing the nozzle orifice and consequent serious disruption of the spray formation, which further upsets the combustion and increases the tendency to carbonization.

Guard From Contamination

"Perhaps the most important factor, however, involved in the first half of our problem is the necessity for providing only clean fuel in the fuel injection system of the engine. Undoubtedly, one of the most prolific sources of trouble in diesel engines is the use of dirty fuels and by this is meant the introduction of solid matter after shipment from the refinery. By far the greatest cause of this contamination is careless handling in the field and this applies particularly to mobile equipment . . . . Clearly no amount of ingenuity in drawing up rigid specifications will guard against this form of contamination."

Discussing the second phase of the problem Rendell said, ". . . . the most important specifications are ignition quality, volatility and Conradson carbon." He then told of the work that has been done to perfect the test for cetane number, but added that, "Now important as cetane number is, it is not the whole criterion of the quality of a diesel fuel in regard to its combustion qualities . . . The volatility of a fuel also plays some part in the combustion . . . . One difficulty in discussing the effects of fuel volatility on combustion is due to the lack of a suitable volatility scale and it is unfortunate that this lack of a suitable test forces one to base the volatility of light fuels on the A. S. T. M. distillation and that of heavy fuels on the Conradson carbon test since neither test is of use in the other case and some common basis is very desirable."

Retailers Talk Divorcing Wholesaling from Retailing

By Staff Writer

ROCHESTER, N. Y., Oct. 1.—Five hundred members of the National Assn. of Petroleum Retailers, whose creed makes price-cutting and chiseling synonymous, at their fifth annual convention which closed today passed two resolutions seeking government aid in price maintenance.

Unaware of, at least too late to forstall any inconsistency, they heard and applauded two conservative economists who warned of the folly of legislative cure-alls.

Resolution number one endorsed the bill sponsored by Congressman Fred Biermann, of Iowa, divorcing marketing from other branches of the oil industry, provided it was amended to divorce wholesaling from retailing.

Commented speaker Dr. Stanley F. Teele, assistant professor of marketing of Harvard Business School: "If it's sound to protect the retailing independent, it is sound to protect the independent jobber, the independent refiner, the independent producer and so on, with the result that in the end the economies of integrated operation would be lost and the public would suffer in dividing business up into water tight compartments."

Assail FTC

Resolution number two condemned the failure of the Federal Trade Commission to approve the voluntary oil code proposed by the oil industry's Committee of Three. Wilmer R. Schuh of Milwaukee, president of the retailers' association, is one of the three committee members who have worked months to secure the code's approval. The trade commission said the code was inimical to the purposes of the anti-trust laws.

Robert M. Thomas of Denver, a vice president of the retailers' association, touched off the denunciation of the FTC.

"The decision (of the FTC) is a breeder of the most open type of unfair competition," Thomas fairly shouted. "What I want to know is, has there been a deal between two government branches, whereby the Department of Justice was free to prosecute other members and branches of the oil industry under a Hitleristic type of dictatorship?" This was generally taken to refer to the trial opening Oct. 4 of 23 oil companies, and 58 individual oil men at Madison, Wis., on charges of conspiracy in violation of the Anti-Trust Act.

Schuh said there would be better co-operation within the industry under the protection of the proposed code. A number of companies his officers have attempted to contact on marketing practices have refused to co-operate under present conditions, he said.

Commercial Discounts

A third resolution called upon all suppliers to give co-operation in eliminating the abuse of the commercial discount. Here again Dr. Teele trod on some toes, as he warned he might do.

A digest of addresses given at the School of Marketing of the retailers convention will be found on page 20.

"I read in the PETROLEUM NEWS where a dealer president said that at least 35 per cent of the Pittsburgh gallonage was sold on a commercial basis. I fail to share his concern over this fact. . . .

It's shooting at the moon to expect to get the business of a grocery chain with a supply base located on a spur track, with its own storage facilities, but there are many commercial users who would prefer to buy from retail filling stations, but are not willing to pay full retail prices, he said.

Dr. Teele said by way of illustration that he once operated a small restaurant. He bought considerable food at wholesale, but on many occasions he found it more convenient to buy from local retail merchants. These merchants, he said, granted his restaurant a ten per cent discount because they realized, if they wanted his business at all, they would have to make concessions. Likewise, he continued, the only way to attract the commercial buyer, who is operating his business with an eye to profit, is to offer price concessions. They will be made by smart operators, he concluded, regardless of efforts by associations or price posting laws to prevent them.

Ridiculous Advertising

Repeating a resolution of last year, the association addressed the American Petroleum Institute to "cut out ridiculous advertising" by oil companies and recommended that the industry "take a leaf from the railroads" and promote travel (to increase total gallonage) and goodwill toward the industry.

Commented E. Chat Shanks, of Milwaukee, executive secretary: "If the present trend continues our gasoline advertising will be nothing but comic strips."

That the National Assn. of Petroleum Retailers has grown rapidly under the stimulus of the Dealer Marketing Plan was evident from a wholesale revision of the administrative organization effected at the convention.

Toughest problem of the association has been to get its work done with officers scattered over the country. Under the effected revision of the by-laws, Schuh said, greater freedom of action is allocated to central officers at Milwaukee. Forming a cabinet for the top men in the organization, Schuh and Shanks, president and executive vice president respectively, will now be six vice presidents and the chairman of the board of directors. The board was increased from 25 to 50 members.

While the membership has increased at a remarkable rate it was said—(Schuh estimated his membership at 60,000-70,000), remaining with the association is the problem of raising money to meet the increased expense of increased activities. In the words of the ways and means committee:

"During the past year the receipts of the N. A. P. R. from member associations has improved, but not sufficiently to carry on the work, which has expanded faster than the receipts increased." As a federated organization, the association is not only dependent upon members paying their dues, but must rely on the locals turning over to the national association its share of the receipts. Proposed to the board of directors and referred to the ways and means committee was a plan for incorporation of the National Assn. of Petroleum Retailers, with purchase of stock by the locals.

The convention proper closed last night with an initiation of some 30 members into the Grand Knights of the Hose, N. A. P. R.'s "40 and 8."

'Gas' Tax Deductible

WASHINGTON, Oct. 4.—The Internal Revenue Bureau has ruled that the gasoline consumer who pays the Pennsylvania state liquid fuels tax may deduct the amount paid from his income in computing his federal income tax.

Said In Rochester At Dealer Meeting

Dr. Stanley F. Teele, assistant professor of marketing of Harvard: "The majors have engineered the Dealer Marketing Plan because they believe that experience with it will so thoroughly disgust dealers that they will be glad to return to a situation where prices and margins are dominated by the major companies."

* * *

Wilmer R. Schuh, president of the National Assn. of Petroleum Retailers: "Either the industry gets a code or it is going to know why the hell it doesn't."

* * *

E. Chat Shanks, executive vice president of N.A.P.R.: "If the present trend continues, our gasoline advertising will be nothing but comic strips."

* * *

R. M. Thomas, a vice president of the N.A.P.R.: "What I want to know is, has there been a deal between two government branches, whereby the Department of Justice was free to prosecute other members and branches of the oil industry under a Hitleristic type of dictatorship?"

Administrative Staff Of Dealers Named

ROCHESTER, N. Y., Oct. 1.—Under a revision of the by-laws, approved at the 5th annual convention of the National Assn. of Petroleum Retailers, the following men are administrative heads of the organization:

Wilmer R. Schuh of Milwaukee, president, and E. Chat Shanks of Milwaukee, executive vice president.

Fred L. Brewer of LaGrange, Ill., chairman of the board of directors. The board consists of 45 men, with 5 vacancies.

Each of the vice presidents is in charge of a division of the association. Vice presidents in addition to Shanks are M. E. Holland of Racine, Wis., projects; J. L. Hill of Rochester, committees; W. M. Boutin of Lake Forest, Ill., marketing; D. W. Shaw of St. Louis, legislation; F. H. Ellis of Pittsburgh, finance, and R. M. Thomas of Denver, organization.

Technical Conferences Feature Of Houston's Oil-World Expo.

N. P. N. News Bureau

TULSA, Oct. 4.—The latest in oil refinery and production equipment and a program covering numerous technical and engineering problems in field and plant, will be offered at the Oil-World Exposition, Oct. 11 to 16, at Houston.

The exposition, successor to the Oil Equipment and Engineering Exposition held annually in Houston the past seven years, will be held in the new Coliseum built at a cost of $1,337,000. John R. Suman, Humble Oil & Refining Co., is president of the show.

In addition to the exposition's own program, there will be the annual meeting of the Independent Petroleum Assn. of America, Oct. 13 to 16; a meeting of the petroleum division of the American Society of Mechanical Engineers Oct. 12, and of the Interstate Oil Compact Commission, Oct. 14 and 15. There will also be a session of the Motor Transportation Division of oil companies, Oct. 12 and 13; an all-day first aid contest, and a meeting of the safety and first aid committee with six papers to be presented Oct. 16; a luncheon of the California Oil Men's Assn., and a barbecue and golf tournament by the Rocky Mountain Oil Men's Assn. A session Oct. 16 of the New Patents and Inventions Committee, under the chairmanship of Lester B. Clark, patent attorney, will hear the address "Judging of New Patents."

The refinery program, which includes a conference on refinery laboratory processes, will be presented Oct. 12; the conference on refinery measurements and control, sponsored by A. & M. College of Texas, Rice Institute, and the University of Texas, will be presented Oct. 13 and 14; and a session on refinery engineering, Oct. 15.

The production program, known as the directional drilling committee program, is scheduled for Oct. 12.

Refinery Program

The refinery program, beginning 9 a.m., Oct. 12, includes:

"Salt Removal From Crude, Chemical and Physical Methods," Dr. S. K. Talley, Shell Petroleum Corp.

"Controversial Methods of Asphalt Testing," H. W. Slaughter, E. W. Saybolt & Co.

"Treatment of Boiler Feed Water," H. L. McMullen, Missouri Pacific Railway.

"Accelerated Method of Determining Stability of Cracked Fuels," A. W. Trusty, Arkansas Fuel Oil Co.

"Evaluation of Crudes in the Laboratory," Dr. L. C. Kemp, The Texas Co.

"Testing Methods for Determining Quality of Used Lubricating Oils," B. D. Ward, Humble Oil & Refining Co.

"Oxidation of Lubricating Oils," Dr. H. A. Ambrose and Dr. C. W. Montgomery, Gulf Research Development Corp.

The conference on refinery measurement and control will be presided over by the following heads of the various engineering departments of their respective universities: Rice, Dr. A. J. Hartsook, J. S. Waters and J. H. Pound; Texas U., H. E. Degler, M. N. Heller, Byron E. Short, and H. H. Power; and A. & M., Dr. C. C. Hedges, F. F. Bishop and C. W. Crawford.

The program for this conference is:

Control Methods

"Measurement and Control of Refinery Processes," Phillip Darling, Pan American Refining Co.

"Measurement of Flow," A. F. Benson, American Meter Co.

"Measurement of Temperature by Thermometry," A. J. Fleig, Taylor Instrument Co.

"Potentiometer Pyrometry," G. C. Graf, Leeds & Northrup Co.

"Development Trend in Pyrometry," C. O. Fairchild, C. J. Tagliabue Manufacturing Co.

"Selection of Valves for Automatic Control," R. A. Engel, Fisher Governor Co.

"Measurement of Pressure," Paul A. Condit, Mason-Neilan Regulator Co.

"Control of Temperature," H. N. Schmitt, Brown Instrument Co.

"Control of Flow," J. B. McMahon, Foxboro Co.

Directional Drilling

The directional drilling committee's program, Oct. 12:

"Progress Report on Fluid Meters Research," E. E. Ambrosius, director of Fluid Meter Research Department, University of Oklahoma.

"Rotary Engines," Nathan Janco, Reed Roller Bit Co.

"Historical Review of Production Experience on Deviated Wells," H. John Eastman, Eastman Oil Well Surveying Co.

"Oriented Coring," A. B. Patterson and J. K. Butler, The Texas Co.

"Well Surveying Methods," a symposium by Norman L. Dorn, Lane-Wells Co.; R. S. Hyer, Sperry-Sun Well Surveying Co., and James K. Hughes, Eastman Oil Well Surveying Co.

"Technique of Controlled Drilling," Douglas Ragland, Humble Oil & Refining Co.

"Sulphate Resisting Cement," Sven Nordam, Trinity Portland Cement Co.

"Trend in Casinghead Plants," Frank Noble, Humble Oil & Refining Co.

Refinery Processes

The conference on refinery processes, Oct. 15:

"Production of Organic Chemicals from Petroleum and Natural Gas," Dr. C. R. Wagner, The Pure Oil Co., Dr. M. B. Cooke and S. R. Swanson, Alco Products, Inc.

"Catalytic Polymerization and its Application to Refining," Dr. Gustav Egloff, Universal Oil Products Co.

"Combination Selective Cracking," Dr. E. R. Smoley, The Lummus Co.

"Metallurgy in Petroleum Refining Processes," E. S. Dixon, The Texas Co.

"Gasoline Treating and Sweetening Processes," Dr. C. W. Rippie, Solvay Sales Co.

"Extraction of Salts from Refinery Stocks by Electrical Process," T. N. St. Hill and G. B. Hanson, Petroleum Rectifying Co.

Safety First Program

The safety-first program, Oct. 16, with C. J. Cohlin, The Texas Co., as chairman, is:

Vic Hayslip, Humble Oil & Refining Co., and Frank Werner, American Petroleum Co. and the Republic Production Co., will discuss various phases of the subject, "Making Full Use of the Practical Protective Equipment Available."

"Methods for Developing Safety Meeting Programs and Conducting the Meetings in a Manner to Make Them Interesting and Instructive," by Louis Emden, Gulf Oil Corp.; C. B. Swanner, Magnolia Petroleum Co.; F. J. Rousseax, The Texas Co., and Harry Jones, Shell Petroleum Corp.

Other exposition side-lights: a "Petroleum Day" in Texas has been proclaimed for Oct. 15 by Gov. James V. Allred; technical films of various leading manufacturers of equipment will be shown daily at the Coliseum, produced by the U. S. Bureau of Mines; concerts nightly by the U. S. Army Band from Fort Crockett, and a nightly searchlight display and sound detector maneuvers by the U. S. Army Aviation Division; three performances by the Humble Oil & Refining Co. Glee Club; an oil men's golf tournament; a wrestling match; dinners with speakers, entertainment and floor show; and a "foreign representatives" banquet, Oct. 13, to all directors of the exposition and foreign visitors.

9 Oil Speakers At Safety Meet

CHICAGO, Oct. 4.—Nine men engaged in safety work within oil companies will present papers on various aspects of safety work at the 26th National Safety Congress and Exposition in Kansas City, Oct. 11 to 15. The Petroleum Section of the National Safety Council, Inc., sponsoring the meeting, meets Oct. 11 to 14. Oil men speakers and their subjects are:

Oct. 11—"Industry's Responsibilities in Community Safety," by H. W. Boggess, Sinclair Prairie Oil & Gas Co., Tulsa.

"Can the Safety Engineer Make Effective Motion Pictures?—A Demonstration of What One Company Has Done," by A. L. Anderson, Standard Oil Co. of California, San Francisco.

Oct. 12—"Field Transportation Problems," by J. U. Teague, Humble Oil & Refining Co., Houston.

"Review of Unusual Refinery Accidents," by R. T. Henderson, Standard Oil Co. (Ohio), Cleveland.

"Handling Pipe," by O. R. Burden, division superintendent, Texas Pipe Line Co., Wichita Falls, Tex.

Oct. 13—"Operating Marketing Motor-Vehicle Equipment," by J. H. Brown, Tide Water Oil Co., New York.

"Lessons from Marketing Department Accidents," by F. R. McLean, Socony-Vacuum Oil Co. (White Star Division), Detroit.

"Does Gasoline Burn?" (Demonstration), by John T. Howell, Union Oil Co. of California, Los Angeles.

Oct. 14—"Statistical Review and Forecast of the Petroleum Industry," by H. N. Blakeslee, American Petroleum Institute, New York.

Crude Buying Change

TULSA, Oct. 4.—Texas producers from whom it buys crude oil will be paid in the future on the basis of 100 per cent of the quantity of oil measured, instead of 99 per cent, Humble Oil & Refining Co. has announced. The change became effective Oct. 1. The company said there was no change in its posted price.

Texaco Posting Sales Policies At Bulk Plants

By Teletype
N. P. N. News Bureau

NEW YORK, Oct. 5. — Marketing policies of The Texas Co. are being officially posted at company bulk plants through the country, it was learned today. The notice explains the company's position as to sales prices and its relationships with commercial consumers and dealers.

Sales prices for gasoline, kerosine, diesel fuel and tractor distillates will be posted for different classes of trade and no deviations will be allowed except for government business, the notice states.

"To prevent further over-expansion of gasoline outlets, and to assist Texaco dealers and commercial consumers in modernizing their places of business with new gasoline pumps, The Texas Co., has made arrangements whereby certain pump companies will sell new gasoline pumps to Texaco dealers and commercial consumers on extended terms, at $5 per pump per month, including interest and carrying charges", the notice states.

Installing and preparing costs are to be paid by the dealer and no gasoline pumps will be loaned to dealers or commercial consumers, according to the notice. All other equipment incidental to operation of a service station is to be purchased by the dealer or commercial consumer.

The Texas Co., will continue its policy of purchasing from a competitor all of the equipment at a location when it takes over a dealer from such competitor.

Lease Arrangement

The section of the notice on leases and rentals states the company will not make any lease agreement, or any rental agreement, with a dealer for a servcie station location where that dealer is or is to be the operator. Nor will it lease any location where competitive products are being dispensed.

At new service stations, where petroleum products have not been previously sold, The Texas Co. will consider a lease on a third party basis only, according to the announcement which is being posted.

The company will not make loans to its dealers or improvements to dealer locations, such as furnishing lifts, improving driveways, curb cuts, and so on, it states, nor will it pay privilege or license taxes for dealers.

No Hauling Allowance

No allowances will be given to a dealer for hauling his purchases from the company's bulk plants, terminals or refineries, it is stated, and no new peddlers, jobbers, or wholesalers, who deliver to dealers in territory served by present bulk stations of the company, will be sold.

The company says it will supply dealers with its usual signs and globes but will not pay sign rental for display of company advertising at dealer's stations.

The posted notice concludes with the statement that "the above policies will be deviated from only when necessary to defend our business from competition."

Calif. Fair Trade Act Upheld in Court Order

LOS ANGELES, Oct. 5. — The Retail Petroleum Dealers Assn. won a moral victory in the Engle vs. Cook case here. The first action brought under the California Fair Trade act affecting gasoline reselling resulted in an order from the Los Angeles County Superior Court permanently restraining Cook, a dealer, from selling Richfield Hi-Octane brand gasoline below the retail price designated by the Richfield company.

However, the court held the defendant may meet competition if a majority of the dealers in his immediate trading area sell this brand at a lower price. No damages were awarded the plaintiffs. Other actions under the Fair Trade act are indicated as a result of this decision.

Wins Golfing Honors In New England

BOSTON, Oct. 4.—Fred E. Bergfors, Quincy Oil Co., took low net honors in the Class A fight for the golfing championship of the Oil Men's Assn. of New England, it was announced today. The tournament has been played monthly throughout the summer in various New England states. F. F. Hale, Hale's Oil Co., Cambridge, Mass., and president of the association, was second low net in Class A.

Henry Pratt, American Oil Co., Boston was low net player in Class B. Second was taken by E. W. Booth of Cities Service Refining Co., Boston.

"Lubricate for Safety" Program Is Studied by Grease Institute

N. P. N. News Bureau

CHICAGO, Oct. 5. — The slogan "Lubricate For Safety Every 1000 Miles," first introduced over a year ago, may become a catch-phrase to the motoring public this coming year if a proposed program of advertising is accepted by the National Lubricating Grease Institute. Such a program of promotion, involving national and trade paper advertising and publicity was presented to the Institute at the opening of its Fifth Annual Convention here Oct. 4.

The advertising plan was outlined by J. C. Bachrodt, Chicago, advertising man who has been active in publicity work for the institute during the past year.

H. C. Mougey, Detroit, chief chemist of the Research Laboratory Division of the General Motors Corp., praised the oil industry for the unexpectedly excellent manner in which it has produced and distributed hypoid lubricants the past year.

He pointed out that General Motors was not interested in selling lubricants, but out of necessity adopted the policy of approving hypoid lubricants until such time as his company was assured the distribution was satisfactory to eliminate the practice. He outlined the four steps in the shifting of the responsibility for hypoid gear lubrication from the motor car manufacturer to the oil refiner and distributor.

First, he stated, car dealers only were supplied with tested lubricants for all rear axle servicing. Second, this policy was dropped and there was issued an approved list of lubricants to be supplied by refiners and marketers to filling stations and garages.

Third Step

He said that the third step is desired for the beginning of the 1938 production season. This would involve including with the approved list, lubricants meeting certain specifications without having been tested by General Motors. The fourth step calls for recommendations by a descriptive name or number only. A committee of the Society of Automotive Engineers is now working on this problem.

Charges of lack of co-operation were lodged against grease makers by Dr. W. S. James, chief engineer, Studebaker Corp., who said they showed an unwilling attitude to work with automotive bearing designers in solving lubrication problems and minimizing the number of lubricants required.

He pointed out the desirability of using fewer lubricants and of simplification and standardization in lubrication as a benefit and protection to motorists, and decried the apparent failure of the grease makers to supply full information as to physical properties of their lubricants. In spite of much lack of fundamental knowledge, he emphasized that designers could still use the experience of lubricant makers when bearings were being designed, rather than their criticism afterwards.

Roller Bearing Lubrication

O. L. Maag, Timken Roller Bearing Co., pointed out some of the properties of various greases and their applications to roller bearings. The need for more standardization and fewer types of lubricants was expressed by J. S. Keller, sales director, Chek-Chart Corp. He challenged the advertising of some companies which claim to have "scientific specialized lubrication," pointing to a recent survey which showed the generally incomplete lubrication stock handled by many service stations. A change in advertising methods which employ as a criterion longer mileage oil changes, to a unified program of regular chassis lubrication every 1000 miles was strongly recommended.

The Oct. 5 session was opened by Ralph R. Matthews, Battenfield Grease & Oil Corp., who outlined some of the newer methods and equipment used in testing lubricating greases.

The difficulty experienced with pre-lubricated bearings in storage was discussed by H. R. Reynolds, chief engineer, Fafnir Bearing Co.

C. C. Pecu, lubrication engineer, Lackawanna Steel Co., outlined the various types of lubrication in the steel mill. Homer F. Wilhelm, of Socony-Vacuum Oil Co., Inc., is president of the grease institute.

Plan Carbon Black Plant

TULSA, Oct. 4.—Columbian Carbon Co. plans to start construction by Oct. 10 on a $400,000 carbon black plant in the Saxet field about nine miles west of Corpus Christi, Tex. Gas from the Southern Minerals Corp.'s natural gasoline plant will be processed. Construction will require about six months, it was reported.

Attempts to Hamper Tracksides Wasted Effort, Marketing Expert Tells Dealers

Staff Special

ROCHESTER, N. Y., Oct. 1.—Petroleum retailers of the country should press for action on the proposal that integrated oil companies be required to set up their accounting methods in such manner that their losses or profits separately on their marketing and other operations be available to the public. So stated Dr. Stanley F. Teele, assistant professor of marketing of Harvard Business School, at the School of Marketing, a feature of the convention here of the National Assn. of Petroleum Retailers.

"Until such information is before us," he said, "reasoning on the desirability of breaking up the integrated companies must be inconclusive."

As regards the so-called divorcement legislation, which the retailers discussed at their convention, Dr. Teele said that, if such legislation is sound to protect the independent retailers, then it is also sound to protect the independent jobbers and refiners and so on to the end that the public would finally suffer from dividing business up into "too many watertight compartments."

Pointing out that as business men, service station proprietors are primarily interested in obtaining the greatest amount of profit over a long period of time, Dr. Teele divided his talk into a discussion on each of the three factors affecting profit: gross sales, gross margin and operating expenses.

Factors Affecting Sales

Among the factors affecting sales Dr. Teele saw the general trend of gasoline consumption as good, citing in particular greater use of the automobile for shopping trips (as evidenced by building of stores away from crowded shopping centers) and for commercial trucking. He added that the trailer had also raised the gasoline requirements of the touring public.

There is general agreement that the average station volume is not far from 4000 gallons per month, he stated. This represents at least a 30 per cent decline from 1929 when gallonage per station had already fallen materially. Some slight offset has been achieved by selling other items.

Dr. Teele cited two chief reasons for the decline in per-station gallonage: increase in the number of stations and decrease in the percentage of total gasoline sold through filling stations.

Increase in Stations

In 1929 the Census Bureau found that there were 121,513 filling stations. This does not include all the outlets for gasoline, as the country store, garage, etc. were not classed as filling stations. This same procedure was followed in 1935 when the Census Bureau counted 197,568 filling stations. During the years between 1929 and 1935 when the country went through its worst depression the number of filling stations in operation rose 60 per cent.

To put it another way, stated Dr. Teele, in 1929 for every filling station there were on the average 218 motor vehicles to be supplied with gasoline and oil; In 1935 for every filling station there were 130 vehicles.

He said station building was largely due to the major oil companies. He attributed the building to the nature of the crude oil business, which oil must find a market, and the higher percentage of fixed costs in the industry. Under these two factors, pressure of crude toward a market and high percentage of fixed costs, Dr. Teele said most of us would have followed the same tactics as the major oil company executives. From the standpoint of the industry as a whole, however, these tactics, he said, have only diluted gallonage to the point where marketing is operated at a loss, and had such an adverse effect on the retailers as to stimulate hostile legislation.

Other Outlets

Under the Census Bureau definition of a filling station, Dr. Teele said that in 1929 such outlets sold slightly more than 75 per cent of the gasoline used in that year.

He estimated that, by 1935, filling stations sold only 60 per cent of the total gasoline used. He said that this was partly due to competition from non-petroleum outlets (such as automobile dealer stations), but of more importance was the point that commercial consumption, not customers of retail stations, has been estimated at 40 or 45 per cent of the gallonage.

He incidentally added at this point that, while customers will not stop driving their cars because of the gasoline taxes, it is clear that the level of consumption would be still higher with less burdensome rates.

If this analysis of the basic reasons for the decline in sales of the average station is correct, the question arises, Dr. Teele continued, "What should the petroleum retailer do about it?" He said courses of action divide into two groups: action of associated dealers and action as individuals.

Under the former, Dr. Teele said that the association might seek legislation to prevent integrated companies from engaging in marketing. He said he understood the association of petroleum retailers was already on record as endorsing this plan. He opinionated, however, that if such legislation to protect the retailing independent is sound, it is also sound to protect the independent jobber and independent refiner and so on; with the result that, in the end, the economies of integrated operation would be lost and the public would suffer in dividing business up into water tight compartments.

A news account of the 5th annual convention of the National Assn. of Petroleum Retailers will be found on page 17.

Segregated Accounting

These objections do not apply to the proposal that integrated companies should be required to set up their accounting methods in such a manner that the costs and profits or losses involved in production, transportation, refining, and marketing may be made available, he added. Until such information is before us, he said, reasoning on the desirability of breaking up the integrated companies must be inconclusive. The retailers' association might well press for such action, he said.

Dr. Teele advocated that the association work to modify the so-called laws of capture and offset drilling, although superficially it would seem these problems belong to another branch of the industry. He also advocated a wider dissemination of information on costs, so that prospective operators would be more cautious in entering the business.

Business buyers — the commercial buyer — buy on specification and price and it is wasted breath to say that their purchasing from the wholesaler is unethical, said Dr. Teele, because such purchases are rooted in the very nature of the business. Better, to concentrate on securing the portion of business that is available to the retailer, he said, and stabilizing the conditions under which commercial business is handled, rather than attempting to force, by legislation or otherwise, all this business through retail outlets.

What Individual Can Do

Pointing out that all stores of all kinds showed a 50 per cent mortality between even the good years of 1925 and 1930, Dr. Teele said there was no way of guaranteeing profits for all. The primary method whereby each operator can make his particular station profitable is to find out what kind of service his particular clientele wants—or individual customers want, then provide that service. Thus some are primarily interested in price, others in convenience and service. Cater to which ever type your station attracts, a point largely determined by its location: highway or neighborhood, he told the dealer.

Gross Margin

In discussing the economic factors that affect gross margin, Dr. Teele expressed the opinion that the majors had engineered the Dealer Marketing Plan because they believed that experience with it will so thoroughly disgust the dealers that they will be glad to return to a situation where prices and margins are dominated by the major companies. Much understanding and effort on the part of dealers will be necessary to prevent this development, he said.

In accordance with economic law, Dr. Teele explained to the convention, prices are set by bargaining between buyer and seller, each acting like one blade of a pair of scissors. It is a further economic law that prices tend to be stabilized slightly above the cost of the more efficient operators. At prices less than this figure, not enough gasoline (or any product) is supplied to meet demand. At prices higher than this figure, competition is invited and the high-priced operators are forced out.

Striking at attempts to block

by legislation the efforts of those introducing real economies in conducting their business, Dr. Teele said, "Efforts to hamper the development of methods of retailing which have genuinely lower costs, in the past always have been failures. I see little to be gained by petroleum retailers spending time and effort seeking to hamper the trackside operator.

Remember that most tracksides are inconveniently located and that many people prefer to buy where they receive more service. For these reasons the trackside will draw only a percentage of the public, but that percentage will depend upon the size of the differential between the trackside price and the general price, upon the amount of inconvenience involved for people in visiting the trackside, upon the general level of employment and income in the territory. The trackside operator with lower costs is necessarily a factor in the retail price of any territory.

"As you know, costs per gallon typically vary with the size of the filling station," he said. "There are not many adequate figures available, but one study of a city in the middle west showed that the costs per gallon for stations with a monthly gallonage of 20,000 were 3.35 cents; for stations with monthly gallonage of 6000, 4.39 cents; and for stations with monthly gallonage of 2500, 6.88 cents. Naturally the smaller stations press for high per-gallon margins. But they can only get them if the large stations sell at a price much higher than they need to cover their costs. If the large stations do so, under most conditions, they will lose gallonage to tracksides and others. As I see it there is no possible way of actually getting prices high enough to cover the costs of these small high-cost outlets."

A sound price structure is one which is built upon a clear understanding of these factors — and many others — by retailers. When the major oil companies set the retail price it was necessary for them to consider all these factors. The majors undoubtedly made mistakes; independent retailers will also make mistakes, he said.

"I am delighted to second heartily the recommendation of your national association," Dr. Teele added, "that local retailers establish marketing committees for the purpose of studying these matters and reporting to the membership. . . . These committees should enlist the co-operation of jobbers and suppliers."

It should be the function of these committees to survey the territory constantly for conditions are changing all the time, he continued. It should work out proper margins between regular stations and tracksides, between territories, between grades of gasoline, and be sufficiently fearless to resist pressure from high cost stations. An effort to make all stations profitable will result in disaster every time and a complete break-down of the price structure.

The price-cutter who actually has lower costs should be left alone: otherwise somebody else will crop up to take his place. The price-cutter who cuts through ignorance of his costs should be educated to his folly.

Station-blockading has the disadvantage of acquainting the public with the practice of discounting, Dr. Teele added, and the public isn't much interested in fights among a particular group of independents, however much sympathy it might have for a little fellow's fight against big business.

The Commercial Buyer

While the petroleum retailer may feel his problem of competition for the business of the commercial buyer is unique, the professor said, actually every retail store is faced with a similar problem. Each retail store has only three alternatives: it can pass up the commercial buyer; it can set up separate division (stores) for handling commercial business, or it can quote a price sufficiently near the wholesale price to make it attractive to the commercial buyer.

It's shooting at the moon to expect to get the business of a grocery chain with a supply base located on a spur track, with its own storage facilities, said Dr. Teele, but there are many commercial users who would prefer to buy from retail filling stations, but are not willing to pay full retail prices. He illustrated this point with the statement that he once operated a small restaurant. He bought considerable food at wholesale, but on many occasions it was more convenient to buy from local retail merchants. These merchants, he said, granted his restaurant a 10 per cent discount because they realized if they wanted his business at all, they would have to make concessions. Likewise, the only way to attract the commercial buyer, who is operating his business with an eye to profit, is to offer price concessions. They will be made by smart operators regardless of efforts by associations or price posting laws to prevent them, he said.

Such commercial discounts, however, can run wild, he cautioned. "The only suggestion that I can see is to authorize the marketing committees to draw up regulations to limit the use of commercial discounts to genuine commercial purposes," he said. He warned of caution in not violating the anti-trust laws in these activities, however.

Dr. Teele concluded with remarks on the need of accurate bookkeeping of operating costs with a view to eliminating wasteful practices.

* * *

Other Speakers

Other speakers at the retailers' convention School of Marketing were Dr. Willard L. Thorpe of New York, economist associated with Dun & Bradstreet, and J. S. Keller, of Chicago, Chek-Chart Corp.

Human history has showed, Dr. Thorpe told the delegates, that "when you try to legislate human behavior, you often get unexpected results which may be just the opposite to what you are trying to achieve. . . . Legislation can't be substituted for efficient operation, and you can't change fundamental economic conditions by law. . . . Sometimes when government starts regulating an industry the only way it can do a satisfactory job is by control the industry doesn't care for."

Some delegates said they were less enthusiastic about chain store laws after Dr. Thorpe had said they tended to encourage the super-market (including the super-service station), competitor of the independents.

Merchandising

Filling station owners were told by Keller that they owed it to the public as well as themselves to make more thorough checks of the cars they service with gasoline and oil.

"There are too many bald-headed tires, moth-eaten windshield wiper blades, frayed fan belts and anemic batteries driving around the country," he said.

"There's a billion dollars worth of replacement business every year," he continued. "Yet filling stations get only 25 per cent of it."

Executive Promoted

CHICAGO, Oct. 2.—E. F. Critchett, assistant manager of the Huron, S. D. division of the Standard Oil Co. of Indiana, has been made motor oil sales promotor in the company's general office. Ross B. Matson, sales promotor at Minot, N. D., succeeds Critchett at Huron.

Hearing Called On Tanker Rules

N. P. N. News Bureau

WASHINGTON, Oct. 4.—Public hearings by the Bureau of Marine Inspection and Navigation on proposed amendments to the Commerce Department's general rules and regulations for tank vessels will open here Oct. 11, the bureau has announced.

Copy of the proposed amendments, promulgated Nov. 10 last year, have been sent out by the bureau to tanker owners and other interested parties with the statement:

"Being fully cognizant of the difficulties and inconveniences encountered by the owners of tank vessels in complying with these rules . . . . the Bureau solicits wholehearted co-operation of all concerned to the end that all tank vessels be brought into compliance as rapidly as possible, so that a safer condition will prevail. . . ."

Tanker owners and others interested in the rules have been asked to submit proposals for amendments in writing before the hearings.

At the same time the bureau announced that its inspectors had conducted initial inspections of 985 tank vessels.

Sept. 18 Crude Stocks 309,405,000 Bbls.

WASHINGTON, Oct. 4.—Stocks of foreign and domestic crude petroleum Sept. 18 were 309,405,000 barrels, a gain of 351,000 barrels over Sept. 11, but still below the 1937 record of 310,417,000 barrels reported on Sept. 4, according to the U. S. Bureau of Mines.

Stocks on Sept. 19, 1936, nearest comparable date last year, amounted to 297,950,000 barrels.

Stocks by grades, showing changes, follow:

(Thousands of Barrels)

Grade	Sept. 18	Sept. 11	Chge.
Penna. grade..	4,334	4,272	+ 62
Other Appal..	835	866	— 31
Lima-NE Ind.-Mich.	1,360	1,437	— 77
Ill.-SW Ind....	9,663	9,670	— 7
N. La. & Ark..	10,336	10,100	+236
W. Tex. & SE N. Mex.....	32,006	31,938	+ 68
East Texas...	25,455	24,802	+653
Other Mid-Con.	128,903	129,331	—428
Gulf Coast...	24,154	24,422	—268
Rocky Mts....	23,738	23,806	— 68
California	26,476	26,493	— 17
Foreign	3,345	3,167	+178
Total incl. foreign	290,605	290,304	+301
*Unreported..	18,800	18,750	+ 50
Total	309,405	309,054	+351

*Estimate.

Jurors Named On First Day

(*Continued from page* 12)

two alternates, to try the case. Moving with stream-lined efficiency, the jury selection was completed in one day.

Summoned by the marshal, approximately 80 members of the jury panel filed into the courtroom, each man—there were no women in the line—had a small white tag in his buttonhole to identify him as a prospective juror and serve as a warning to everyone not to talk to him about the case.

The courtroom was already crowded but the defendants, spectators, and newspapermen who had gotten into the section reserved for the jury panel were moved out, taking places along the walls.

It developed that a number of the prospective jurors had been excused prior to the trial. On call of the judge, 22 others came forward with their reasons why they could not sit on the jury.

Jobber Is Excused

By coincidence, the first man called was an oil jobber—Martin F. Meyer, Monroe, who was excused because he felt that his business affairs needed his attention. Later in the day, one of the local newspapers captioned a picture of Meyer with the statement that he was one of the government's principal witnesses.

In hearing the "unwilling" jurors, Judge Stone wouldn't listen to one man's plea that his wife would miss him but he did excuse him when he pleaded that his business would suffer if he were absent for some weeks.

In line with his announced policy of selecting jurors whose absence from home would entail the least hardship, Judge Stone excused 30 or more on various grounds—poor health, business affairs, government connection, harvesting crops and for similar reasons. Indeed, every man who asked to be excused was let off.

Before the noon recess, Oct. 4, Judge Stone had pushed the jury selection along to a point where 30 were chosen for questioning in search of reasons for possible disqualification.

Of these 30, eleven are now or have been engaged in the sale of gasoline and oil, including filling station attendants, dealers, jobbers, major company tank truck drivers, garage operators and the like, it was developed by Judge Stone's questioning.

With one exception, they said, in reply to the judge's questions, that their relations with the oil companies had been "friendly." The exception was a prospective juror who said he had neld a Shell dealer franchise for seven years but had had some trouble with a supervisor. However, he felt that he could give a fair and impartial trial to the Shell Co., which is one of the defendants. He was later excused by the Judge from serving and, by coincidence, his place on the panel was filled by a man who said he had once sold motor oils for a Minneapolis oil company.

Even after the government and the defense had exercised a total of 16 peremptory challenges the remaining 12 constituting the jury included a gasoline retailer and two other men with some oil background.

Diesel Fuel Exempted From U.S. 'Gas' Tax

N. P. N. News Bureau

WASHINGTON, Oct. 4.—Diesel fuel is not taxable by the federal government as "gasoline," even though it may be used for fuel for motor vehicles, motor boats and airplanes, the Internal Revenue Bureau has ruled, in response to a query from National Petroleum Association.

The bureau held that, so long as Diesel fuel does not fall within the specifications outlined in Article 30 of Regulations 44, as revised in Feb. 1934, it is not subject to the tax, no matter what it is used for.

The article in the regulations referred to describes gasoline which is subject to the tax as " . . . any petroleum product satisfying the volatility requirements, exclusive of vapor pressure, of U. S. motor gasoline," and includes "benzol, benzene, naphtha, or any other liquid of a kind prepared, advertised, offered for sale or sold for use as, or used as, a fuel for the propulsion of motor vehicles, motor boats or airplanes," with certain exemptions.

The board said that in all cases where a specific ruling is desired relative to the taxability of Diesel fuel, it will be necessary to furnish the bureau with a distillation report showing the various distillation temperatures of the product.

Oklahoma Tax Refunds

TULSA, Oct. 4. — Oklahoma's tax refunds on gasoline used for agricultural purposes during the year ended June 30, 1937, amounted to 7.16 per cent of all gasoline inspected by the Oklahoma Tax Commission. Tax refund of $1,007,106.86 was made on 25,690,571 gallons of gasoline used for agricultural purposes.

Trial's Outcome Is Called Vital To Oil Jobbers

N. P. N. News Bureau

WASHINGTON, Oct. 4.—A statement commending the Department of Justice for its investigation of the oil marketing industry which led to the indictments in the oil conspiracy case was issued today by Paul E. Hadlick, secretary of the National Oil Marketers Assn. Hadlick was a member of the committee of independent oil jobbers, whose call on Attorney General Cummings, June 18, 1935, launched the department's investigation.

Hadlick's statement said it was expected that the marketers' association, which is meeting next week in Chicago, would adopt resolutions urging that the Department of Justice continue its investigation of "the oil marketing situations in the East and the West Coast."

"The outcome of these trials in Madison will be of vast importance not only to the independent oil jobber, but also to the consumer of petroleum products," said Hadlick. "It is vital to the success of the effort of our association to restore the open market for petroleum products—from the well to the consumer.

"During recent years the independent jobber has been continually squeezed between the pegged price at which he must buy from the refiner and the maintenance, through marketing outlets controlled by refiners, of retail prices which do not leave the independent jobber a living margin of profit. When we called on Attorney General Cummings 27 months ago, we told him we believed this condition was the result of a fixed policy among the major oil companies to drive the independent marketer out of existence. We are confident that the trials at Madison this month, will prove our contention was true.

"The Department of Justice is to be highly commended for its activity and diligence in enforcing the anti-trust laws, and has had the wholehearted support of our association in its investigation of the oil monopoly. Next week, Oct. 12 to 14, the National Oil Marketers Assn. will hold its annual convention in Chicago, and it is expected the membership not only will adopt resolutions commending the Attorney General and his assistants, but will further urge that the Department of Justice continue to vigorously press its probe of the oil marketing situations in the East and the West Coast."

"Our association and its individual members continue to stand ready, as we have since that momentous conference with Attorney General Cummings in 1935, to give the Department of Justice all assistance within our power to bring forth the facts concerning this monopolization of the oil market, which affects not only the independent dealer but also the consumer, for the restoration of the open market undoubtedly would have an effect on retail prices of petroleum products beneficial to the consumer."

Buying Arrangements In Lisbon Revised

N. P. N. News Bureau

TULSA, Oct. 4.—Revision in its previously announced plans to discontinue taking crude oil from the Lisbon field in Louisiana has been announced by the Gulf Oil Corp.

In a letter sent to the operators of the approximately 125 producers in the field Gulf announced that, instead of ceasing all purchases Oct. 1, it would continue to buy 5000 barrels daily "for a period reasonably necessary for completion of an additional line now being constructed into the field."

The 5000 barrels daily will be taken ratably from the field. This will leave approximately 10,000 barrels daily without a market until the new line is completed about Oct. 15. The line is being constructed by the Grogan Oil Corp. interests of Shreveport. The Gulf corporation is expected to continue to operate its line from the field as a common carrier and several operators are reported to have found markets for their production which will be transported by Gulf.

Grogan officials were reported to have sought to buy the gathering lines and pipeline system from Gulf when the latter announced it was withdrawing from the field, but the deal had failed to materialize.

Atlantic Raises Fuels

PHILADELPHIA, Oct. 4.—The Atlantic Refining Co. announced today that, effective Oct. 6, it would advance tank wagon prices of Nos. 1, 2 and 4 fuel oils 0.5 cent, thru Pennsylvania and Delaware. New prices will be: No. 1, 7.75 cents at Philadelphia, and 8.25 cents generally in Pennsylvania and Delaware; No. 2 and 4, 7 cents at Philadelphia, and 7.5 cents elsewhere.

Atlantic will also advance tank car prices of Nos. 2 and 4 fuel oils 0.25 cent, to 5.25 cents at Philadelphia.

625,000 Barrels For Calif. Oct. 1

N. P. N. News Bureau

LOS ANGELES, Oct. 2.—Although California's central committee of oil producers approved the U. S. Bureau of Mines estimate of 660,000 barrels daily crude oil demand for October production in this state, probably not more than 625,000 barrels a day will be allocated to wells on production Oct. 1.

The remainder of approximately 35,000 barrels a day will be kept in reserve to cover new wells completed and put on production during the month. During September, daily allocation was actually 611,165 barrels although the approved quota was 638,200 barrels.

Over production in the Wilmington field continued to throw proration compliance machinery in the Los Angeles Basin out of gear with the rest of the state. This field produced 61,177 barrels Sept. 29, or 25,177 barrels in excess of the field's quota and its average excess for the first 29 days of September was 22,598 barrels daily.

However, the situation was improved somewhat by the announced plans of Standard Oil Co. of California to build a pipeline into the Wilmington field and to post a price schedule based on a minimum of 75 cents a barrel for the low gravity, high sulfur oils.

The company was reported making three-year contracts with producers in this field on the understanding the oil would be stored in field tankage until completion of the pipeline and that producers would agree to a 20 per cent curtailment of output.

DAILY AVERAGE PRODUCTION IMPORTANT DISTRICTS
American Petroleum Inst. Figures

	Week Ended Oct. 2 Barrels	Sept. 25 Barrels
Oklahoma City	141,750	147,150
Total Okla...	581,200	600,450
East Texas...	479,200	478,000
Total Texas	1,494,000	1,496,550
Rodessa	49,800	50,950
Total La.....	264,300	264,000
California ...	690,200	687,800
E. of Rockies	2,957,250	2,378,500
Total U. S....	3,647,450	3,666,300
Crude imports	80,570	64,570
Tot. new sup'ly	3,728,020	3,730,870

Topping Plants Hit

Several small refiners, which have been operating topping plants in the Los Angeles Basin on Wilmington crude purchased at 35 to 45 cents a barrel, were reported making the rounds in search of new crude supplies. Without cracking facilities, they declared it was impossible to operate at a profit on 75-cent crude, plus transportation costs from the field to plant.

Early development of the Long Beach Harbor extension of the Wilmington field is expected to follow indicated approval of ordinances for regulation of drilling in that area. The Long Beach harbor commission will meet Oct. 4 for final hearing on an ordinance providing a $750 derrick fee, a $25,000-a-well bond ($200,000 for eight or more wells in the Long Beach area), and other regulatory measures. The measure would become effective in 30 days.

A duplicate ordinance will be heard and probably passed by the Long Beach City Council Oct. 5. Both actions were speeded up by filing of a petition, signed by 7000 Long Beach residents, asking that drilling start immediately. Criticism has been expressed that city officials were preventing private drilling pending shaping of plans for municipal operation.

Meetings were held by harbor commissioners and city councilmen last week to discuss a threat to the city tideland titles arising from the claim by state officials that mineral rights to these lands still rested with the people of California.

Crude Runs Down 56,000 Barrels Last Week; Motor Fuel Stocks Cut

By Teletype
N. P. N. News Bureau

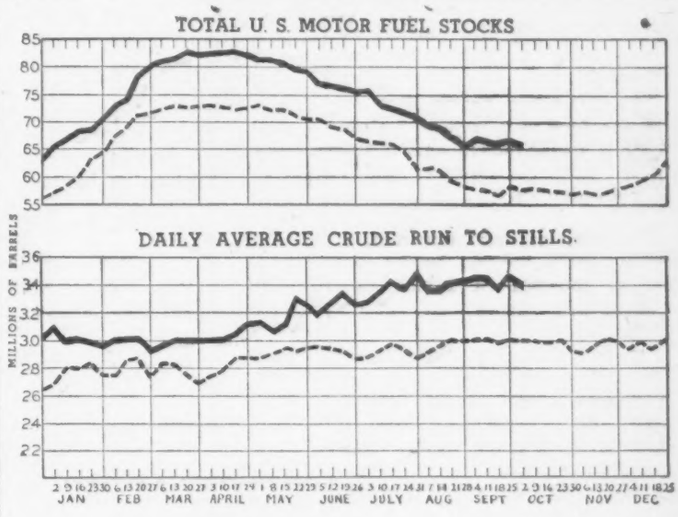
NEW YORK, Oct. 5.—An increase of 584,000 barrels in gas and fuel oil stocks and decreases of 334,000 barrels in motor fuel stocks and of 56,000 barrels in crude runs to refinery stills, were the important changes in refinery operations the week ended Oct. 2, according to the American Petroleum Institute. This is at 89.4 per cent of the country's plants, operating at 83.7 per cent capacity the past week.

There were no great changes in crude runs to stills, except in California, where they were cut nearly 50,000 barrels daily. The next largest change was a decrease of 10,000 barrels in Oklahoma-Kansas-Missouri. The previous week, runs had increased 54,000 barrels and, a month ago, were 46,000 barrels higher than currently.

Motor fuel stocks, which had declined 417,000 barrels the previous week, stood at 61,736,000 barrels Oct. 2. This is 3,530,000 barrels under the total estimated by the U. S. Bureau of Mines for the past week and nearly 4,000,000 barrels higher than stocks a year ago.

Stocks of motor fuel at refineries totaled 32,096,000 barrels at the end of the week, a decrease of 303,000 barrels over the previous week. In-transit and terminal stocks increased 44,000 barrels, to 22,634,000 barrels and stocks of unfinished gasoline were up 13,000 barrels, to 7,006,000 barrels.

The largest decline in motor fuel stocks was one of 179,000 barrels in Indiana-Illinois-Kentucky. Louisiana Gulf stocks declined 147,000 barrels. The largest gain was one of 191,000 barrels in the Texas Gulf. East Coast stocks declined 127,000 barrels and Appalachian 107,000 barrels.



CURRENT REFINERY OPERATIONS

Districts	Per Cent Capacity Reporting	Daily Average Crude to Stills (Barrels) Week Ended		Per Cent of Reporting Capacity Operated Week Ended		Stocks Thousands of Barrels Total Finished and Unfinished Motor Fuel*		Total Finished Gas & and Unfinished Fuel Oil		Gas & Fuel Oil	Cracked Gasoline Production % Total Capacity Reporting	Daily Av. Production (Barrels) Week Ended	
		Oct. 2	Sept. 25	Oct. 2	Sept. 25	Oct. 2	Sept. 25	Oct. 2	Sept. 25			Oct. 2	Sept. 25
East Coast	100.0	554,000	552,000	....	82.5	18,483	18,630	15,716	15,262		100.0	132,000	120,000
Appalachian	88.4	112,000	112,000	....	86.8	2,510	2,617	933	926		94.6	23,000	27,000
Ind., Ill., Ky.	92.4	449,000	454,000	....	92.8	10,059	10,238	7,131	7,158		98.5	153,000	145,000
Okla., Kans., Mo.	84.7	297,000	307,000	....	80.2	6,083	6,073	3,825	3,718		90.3	78,000	83,000
Inland Texas	56.6	139,000	142,000	....	70.6	1,702	1,706	1,703	1,730		71.7	40,000	39,000
Texas Gulf	95.7	778,000	780,000	....	97.9	7,892	7,701	9,995	10,141		98.0	164,000	174,000
La. Gulf	96.6	139,000	131,000	....	78.0	1,602	1,749	3,140	3,170		100.0	25,000	29,000
No. La., Ark.	63.7	42,000	45,000	....	77.6	425	409	401	389		77.5	7,000	8,000
Rocky Mt.	69.7	57,000	51,000	....	82.3	1,294	1,266	733	737		85.4	15,000	14,000
California	90.9	533,000	582,000	....	78.0	11,686	11,690	70,149	69,911		98.0	75,000	72,000
Total Reporting	89.4	3,100,000	3,156,000	....	85.3	61,736	62,070	113,726	113,142		94.8	712,000	711,000
Estimated U. S. Total (Bur. of Mines Basis)		3,400,000	3,455,000	....	....	65,266	65,620	117,076	116,472		....	780,000	780,000

*Includes stocks at refineries, in bulk terminals, pipe lines and in transit.

Skelly To File Brief In Fitts Field Case

TULSA, Oct. 4.—Skelly Oil Co.'s case involving its production from 18 wells in the Park College lease in Fitts field was one step nearer settlement by the Oklahoma Supreme Court as a result of that body's ruling Oct. 1.

The court granted Skelly 15 days in which to file a brief on the merits of its appeal from the Oklahoma Corporation Commission's order reducing potentials of 18 wells. The commission was given 15 days to reply to the Skelly brief and the company five days to answer the reply. Skelly had offered to post a supersedeas bond but the court made no mention of a bond in issuing its ruling.

Okla. Allowable Held 600,000 Bbls.

N. P. N. News Bureau

TULSA, Oct. 4.—Oklahoma's crude oil production allowable for October was left unchanged at 600,000 barrels daily by the Oklahoma Corporation Commission following the market demand hearing at Oklahoma City Sept. 28.

The October figure was set in the face of a request by one of the major purchasers, Stanolind Crude Oil Purchasing Co., for a reduction of 25,000 barrels in allowable. The 600,000 barrels daily average however, is still 29,200 barrels below the U. S. Bureau of Mines estimated for October market demand.

The Oklahoma City-Wilcox Class A pool allowable was left unchanged at 113,516 barrels daily, upon recommendation of W. J. Armstrong, chief conservation officer for the commission. Class B pools were reduced from 134,707 barrels to 131,457 barrels, while Class C pools were left unchanged at 128,681 barrels daily average.

Class D pools were increased from 18,075 to 19,000 barrels daily, while the unclassified prorated areas were increased from 42,021 to 43,517 barrels daily average. Unprorated areas and stripper wells were raised to 163,829 barrels daily.

The Stanolind's request for a reduction was in connection with allowables in the Fitts pool, and was based on its claim of a sharp decrease in bottom-hole pressures. The pressures, it was stated, had declined in the Simpson sand from 1975 to 567 pounds, a drop of 71 per cent, while in the same period 27 per cent of the recoverable oil had been produced.

Meanwhile, the proposed revision in the proration program in the Fitts pool hit another snag when operators failed to reach an agreement and Conservation Officer Armstrong said, after a two-hour conference, that, unless operators got together in a hurry, he would issue orders for per-well proration in each zone, thus forcing some companies to build additional tankage, establish potentials and "hew to the line."

Mid-Cont. 'Gas' Stocks Reduced in August

N. P. N. News Bureau

TULSA, Oct. 4.—Gasoline stocks at 61 Mid-Continent refineries were reduced 670,455 barrels during August, according to the statistical bulletin released by the Western Petroleum Refiners Ass'n. August gasoline shipments exceeded gasoline output by 670,455 barrels, bringing motor fuel stocks Aug. 31 down to 6,476,223 barrels.

A total of 13,549,113 barrels of crude was run through stills at reporting refineries, the W. P. R. A. reported. Gasoline yield during August was 8,288,185 barrels. Kerosine and fuel oil inventories increased during August. Stocks of principal refined products on hand the end of July and August are shown below: (Figures in barrels.)

Product	Aug. 31	July 31
Gasoline	6,476,223	7,146,678
41-43 kerosine	319,622	230,976
42-44 kerosine	163,553	139,295
Tractor fuel A*	191,456	143,139
Tractor fuel B**	53,670	46,292
No. 1 white fuel	288,442	262,126
No. 2 straw fuel	368,719	371,654
14 gravity and below fuel	887,020	927,154

*Non-taxable. **Taxable.

Giddings, Pioneer Oil Operator, Dies

TULSA, Oct. 4.—Frank C. Giddings, aged 85, a pioneer oil operator and real estate developer in Tulsa died Sept. 22 at Oakland, Cal., according to word received here. He had gone to California about six years ago because of ill health.

Giddings came to Tulsa in 1903 and formed a partnership with the late Grant C. Stebbins in the operation of oil properties. He was instrumental in bringing Kendall College, now the University of Tulsa, here from Muskogee, Okla. The college was located on a tract of ground owned by Giddings and Stebbins.

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Apply Vapor Loss Findings

By ARCH L. FOSTER
N. P. N. Technical Editor

Vapor losses from automotive fuel systems have been under fire for several years, from the massed ranks of the refining and natural gasoline industries. Primarily the natural gasoline men, under the goad of need for a greater demand for their highly volatile product, have been the moving force in extending the boundaries of our knowledge of fuels as they are used and required by automotive equipment. The first major work on this problem was carried out by the Natural Gasoline Association of America under the direction of George Granger Brown.

As the vapor pressure of commercial fuels was increased by refiners, vapor lock in automotive engines increased until it assumed the proportions of a major illness. It has been second in importance in the fuel field only to the matter of rating anti-knock quality of gasolines.

Commercial cars have been tested to determine the volatility of fuel which could be handled by their fuel systems. The Reid vapor pressure testing method was standardized; approximate limits were set for trouble-free vapor pressures which could be used by most cars at different seasons of the year. Federal Specifications were adopted based essentially on these findings of the research groups. Motor car manufacturers were told of the errors of their ways in fuel systems and their design; some of them took greater advantage of this information than did others, with the result that some cars now show less tendency to vapor lock than do many others. Many fuel systems still are placed on the same side of the engine as the exhaust manifolds. Some of them have been referred to as very efficient stills, and vapor lock stays with us.

Some manufacturers hit on the expedient of boring holes in carburetors to permit the fuel vaporized therein to escape and avoid vapor lock. This means waste — waste to the air of the finest part of what in practically every case is a carefully balanced gasoline made up of three or four carefully manufactured fuel components, plus tetraethyl lead in the majority of cases to obtain the desired anti-knock rating. This damages mileage returns on the fuel, and the customer cannot trace loss, but pays for it just the same in greater fuel bills. He pays for it also in loss of starting and ignition efficiency, often in lowered octane number of the fuel which reaches the cylinders.

The gasoline group this last summer carried out an exhaustive series of road tests in Oklahoma, using a standardized list of fuels; the fuels were not tested; the cars were tested to see how much fuel was lost when using typical high and low vapor pressure fuels. The data-taking has been completed and the results are being tabulated and correlated, a task requiring a huge amount of work by a number of highly qualified men.

Strange and interesting rumors are afloat regarding the results obtained. Vapor losses which reach a two-digit percentage have been mentioned here and there. Naturally some cars are said to show worse operation than others. Extremely high fuel system temperatures are whispered also. Rumor hath it that these data will be discussed in the open soon, probably at the A. P. I. meeting next month.

Whatever the findings, the information will not be worth the proverbial Continental unless something is done about it. If the automotive engineers are shown to be at fault, the expense of the investigation is futile and reasonless unless those same engineers can be induced to build fuel systems which will eliminate these losses.

If the refiner is not producing the right kind of fuel, all factors considered, then a hard-working and efficient staff will see a summer's work tossed into the ash-can, unless the refiner translates these results into terms of fuel manufacturing processes. So, after the conclusions are reached:

What are we going to do with the information?

Refining Technology

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Two-in-One Copper Sweetening Unit Lowers Treating, Inhibitor Costs ... by J. C. Albright ... R-211

Barnsdall at Wichita, Kans., sweetens both straight-run and cracked naphthas with Perco's copper chloride solid and solution methods, to reduce the amount of inhibitor needed by 20%; costs reduced by about 70% for sweetening.

Patent Literature in Refining Technology ... VI. Synthetic Lubricants ... by J. H. Byers R-218

Sixth in this exclusive series of articles by a patent authority, presenting and summarizing the products and the claims for them, as additives of the synthetic type for lubricating oils. The seventh in this series will appear within a few weeks.

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Qualities of Diesel Fuels which Control Efficiency ... by Robert D. Best R-232

Effect of various physical and chemical properties of Diesel fuels on operating efficiency; a comparison chart for the various units now used to measure ignition quality of Diesel fuels.

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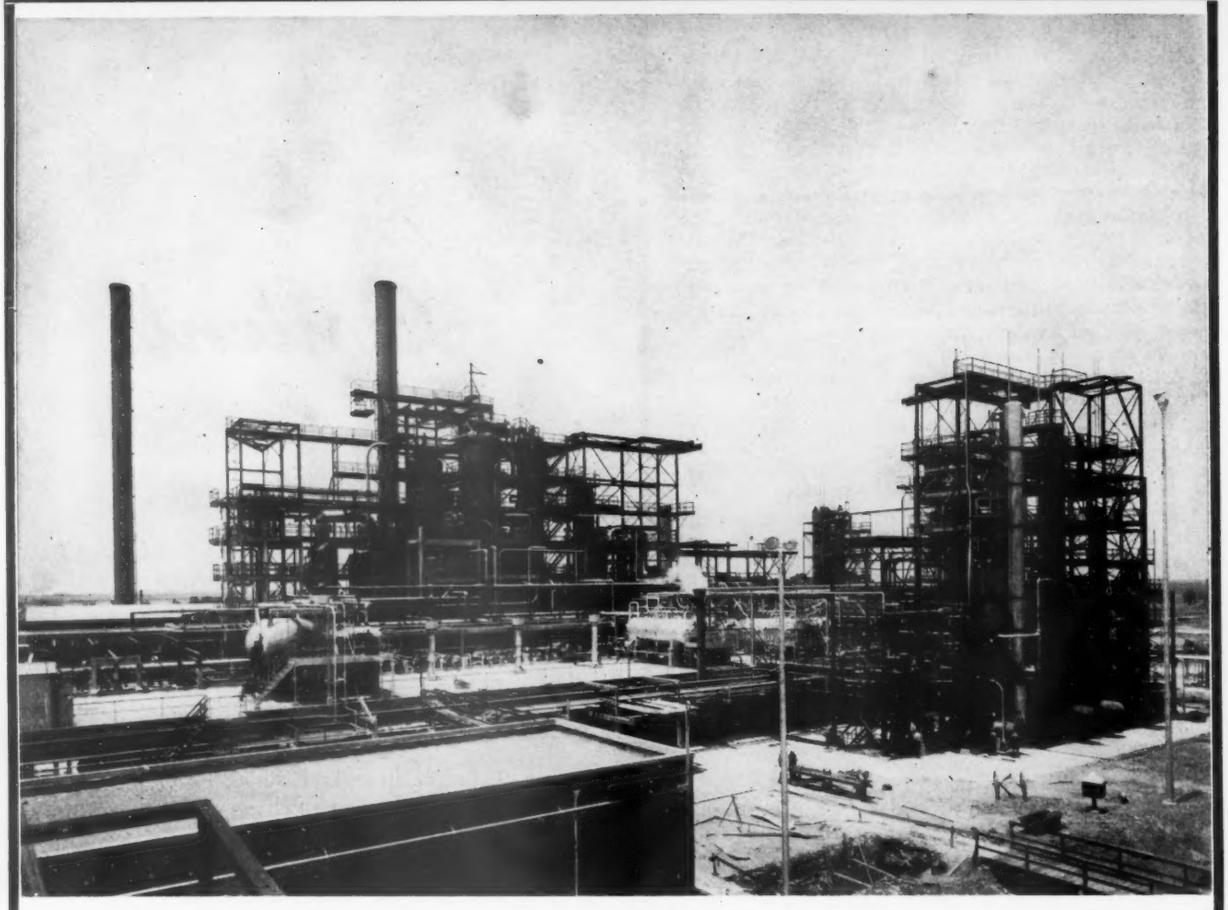
Quality Products are Produced Profitably In Kellogg-Built Units



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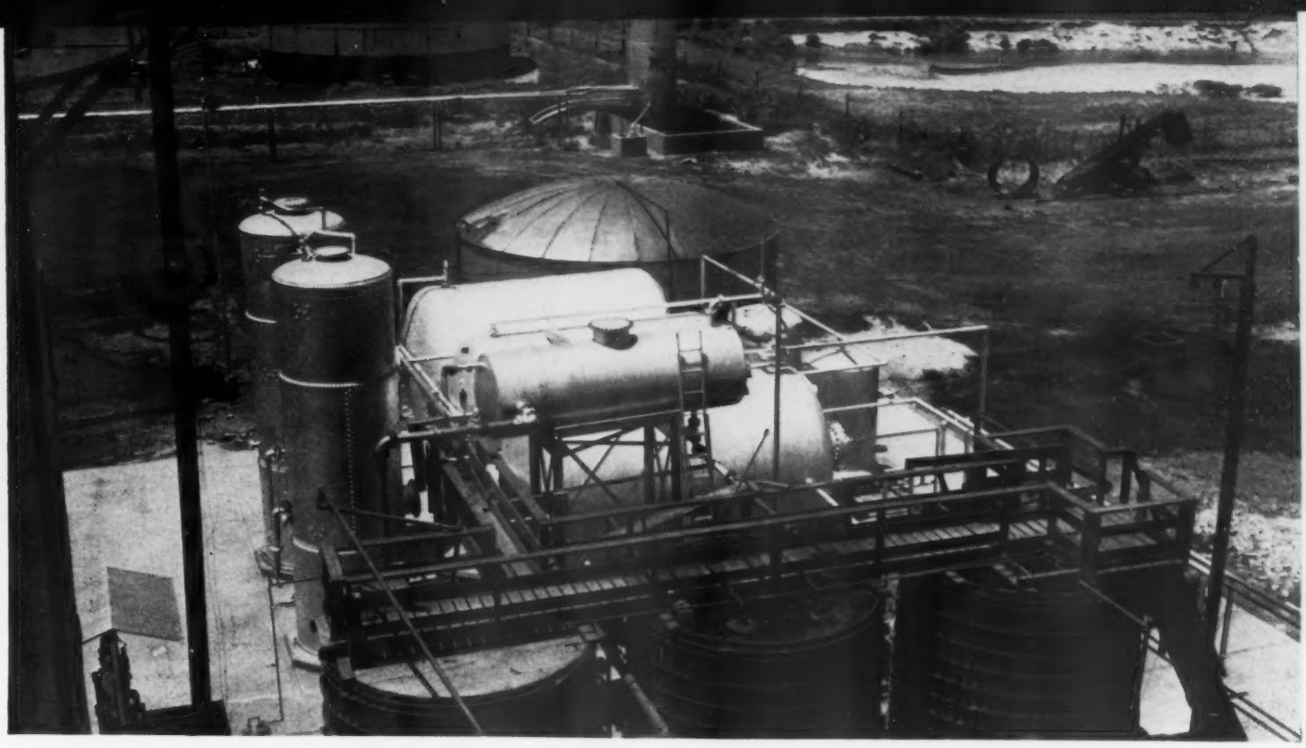


Fig. 1. Barnsdall Perco copper sweetening unit, at its Wichita, Kansas, refinery, which really comprises two units assembled together

Two-In-One Copper Sweetening Unit Lowers Treating, Inhibitor Costs

743.
751.2

By JOHN C. ALBRIGHT

● Sweetening straight-run and cracked naphthas produced from Kansas crudes, Barnsdall Refining Co. at Wichita reduces the amount of inhibitor needed by about 20%, this author finds. Cracked naphtha is mixed in equal proportions with copper chloride solution, separated in a settling tank, and the gasoline stabilized with a $NaOH$-Na_2S solution to remove copper which if present affects seriously the color and gum stability of the gasoline.

Straight-run naphtha is washed with caustic to remove H_2S, and passed through parallel tanks containing each about four tons of solid reagent. Solution is checked with calomel half-cell and platinum electrode periodically, for oxidation potential.

SHORTLY after Barnsdall Refining Company completed its new Dubbs Cracking plant at Wichita, Kansas in the latter part of 1936, Perco copper sweetening units were built to replace batch doctor agitators that had been treating straight-run and cracked gasoline manufactured from Kansas crude. The construction of the copper sweetening plant was inexpensive since a large portion of the materials used was salvaged from previously operated cracking units. This included three 10′ x 20′ reaction chambers which were used for caustic and stabilizing solution settlers and two vertical tanks that contain the solid copper reagent for treating straight-run gasoline. New equipment was needed only for that part of the unit which was in contact with copper solution, and consisted of three wood tanks, a corrosion resistant separating tank, Durichlor centrifugal pumps and the necessary piping.

While the copper sweetening plant is compact, occupying a small amount of space in the refinery yard and from a casual inspection appears to be interconnected, in reality it consists of two complete and separate units; one employing the solution method for treating cracked gasoline, and the other employing the solid reagent through which the straight-run products are passed. Wood receptacles are employed for wet chemical storage and solution regenerating tanks.

The cracked gasoline treater operates by receiving the distillate from working storage in the tank farm after it has been stabilized to the required vapor pressure at the cracking plant and is treated immediately, or as soon as practicable, after it leaves the fractionator receiving drum. Since all of the hydrogen sulfide is removed from the distillate in the stabilizing process, it is unnecessary to remove it by caustic or other chemicals before entering the wet copper system. A centrifugal, motor driven pump takes suction from the working tank and operates primarily as a transfer pump, handling distillate at the rate of approximately 60 bbls. per hour. The Durichlor pump then takes suction on the first pump discharge and also on the outlet connection of the copper solution working tank. Approximately 120 bbls. per hour are handled by the second pump, as the distillate and treating solution are mixed in a 50-50 ratio.

As the reaction between the copper and the gasoline is more satisfactory when the two are intimately mixed, the discharge valve above the outlet of the second pump is manipulated to produce what appears to be a tight emulsion but which actually separates out very readily

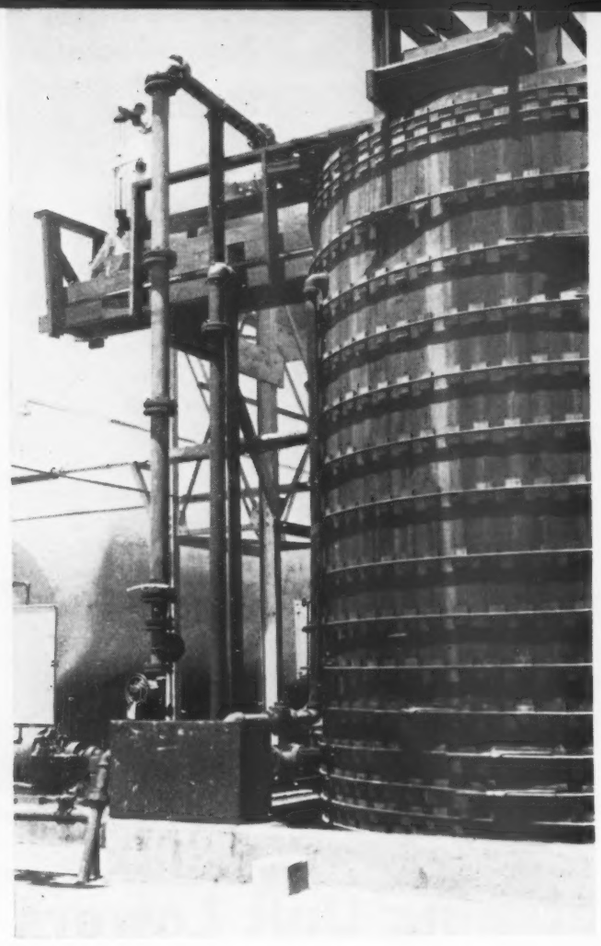


Fig. 2. Durichlor alloy piping on the "wet" side of the copper treating unit at Wichita

and completely. This pump discharges directly into the separating tank, a vessel 4′ x 12′ with a capacity of 1200 gallons, elevated above the other equipment, in which the time element is sufficient for complete separation of the liquids. The gasoline flows out at the top connection, while the solution runs by gravity from a connection on the under side of the vessel. Approximately two feet of solution is carried in the separating tank, the level being maintained by operating a chain wheel valve on the outlet of the vessel.

Solution flowing from the separating tank drops directly to the regeneration tank, one of the wood vessels in the storage battery, which is kept full of liquid. This tank was equipped with air lines for regenerating the solution, the lines passing downward into the solution from headers at the top. The piping entering and submerged below the surface of the solution were made of the special compound of hard vulcanized rubber. The lower ends of these pipes were fitted with alundum diffusing cylinders which give intimate contact between the solution and the air. The second tank receives the regenerated solution overflowing from the first, and is equipped with a gasoline skimmer that removes distillate if ever carried over with the solution. The break between the solution and the distillate in the horizontal elevated tank is sharp enough that with normal operation no gasoline is carried over with the solution.

The third tank in the series of wood vessels is used merely as chemical storage in which the copper solution is mixed when necessary to replenish the charge. Connections were made between the three tanks and the contacting pump so that suction may be taken from either or all three of these vessels if desired. The tanks have a capacity of 250 barrels and were constructed so that no metals are in contact with the solution. They were set on a flat concrete floor with a retaining wall around them to prevent escape of solution when and if any should pass through the seams of the tanks.

As the gasoline passes from the separating tank, it is again picked up by a motor driven centrifugal pump, together with equal amounts of a stabilizing solution to remove traces of copper from the gasoline. After thorough contact of the gasoline with the solution, the mixture is discharged into one of the 10′ x 20′ steel vessels. The stabilizing solution settles out in this vessel, and is circulated continually through the pump and back again. This stabilizing solution contains NaOH and Na_2S. This stabilizing treatment is required because minute quantities of copper are present in the gasoline, and must be removed or the gasoline would deteriorate rapidly with respect to color and gum stability. However, when treated with the stabilizing chemical, gum does not form any more rapidly than in gasolines treated with con-

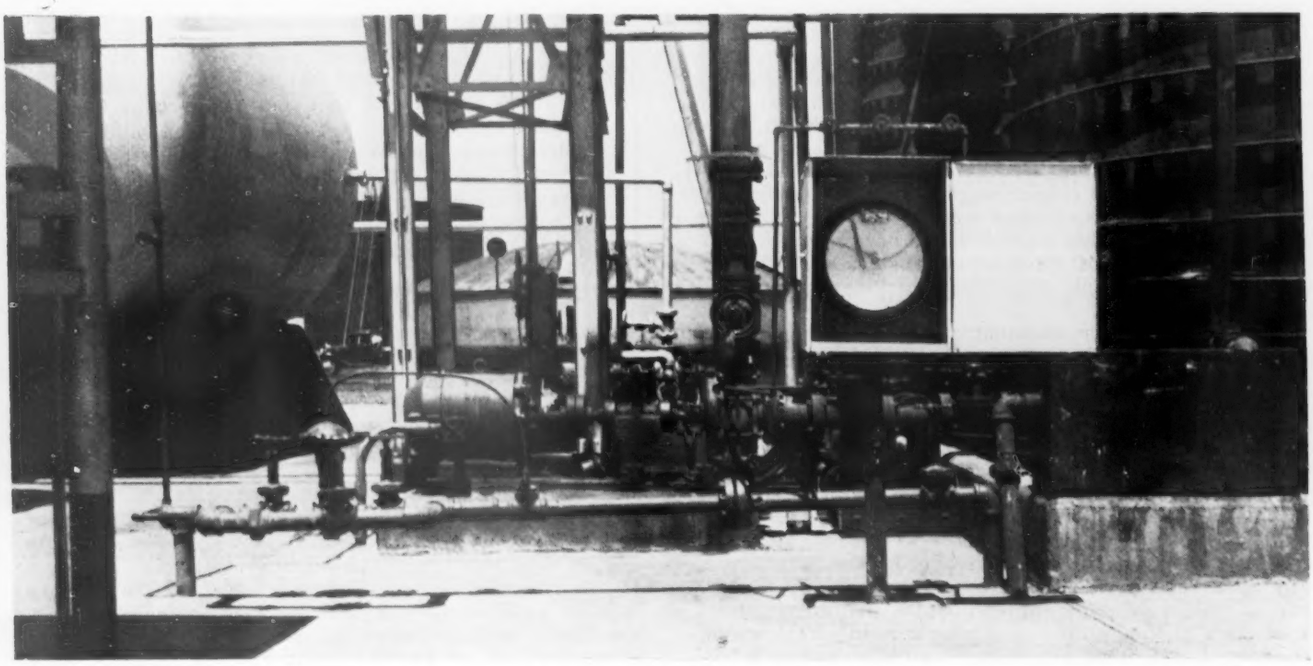
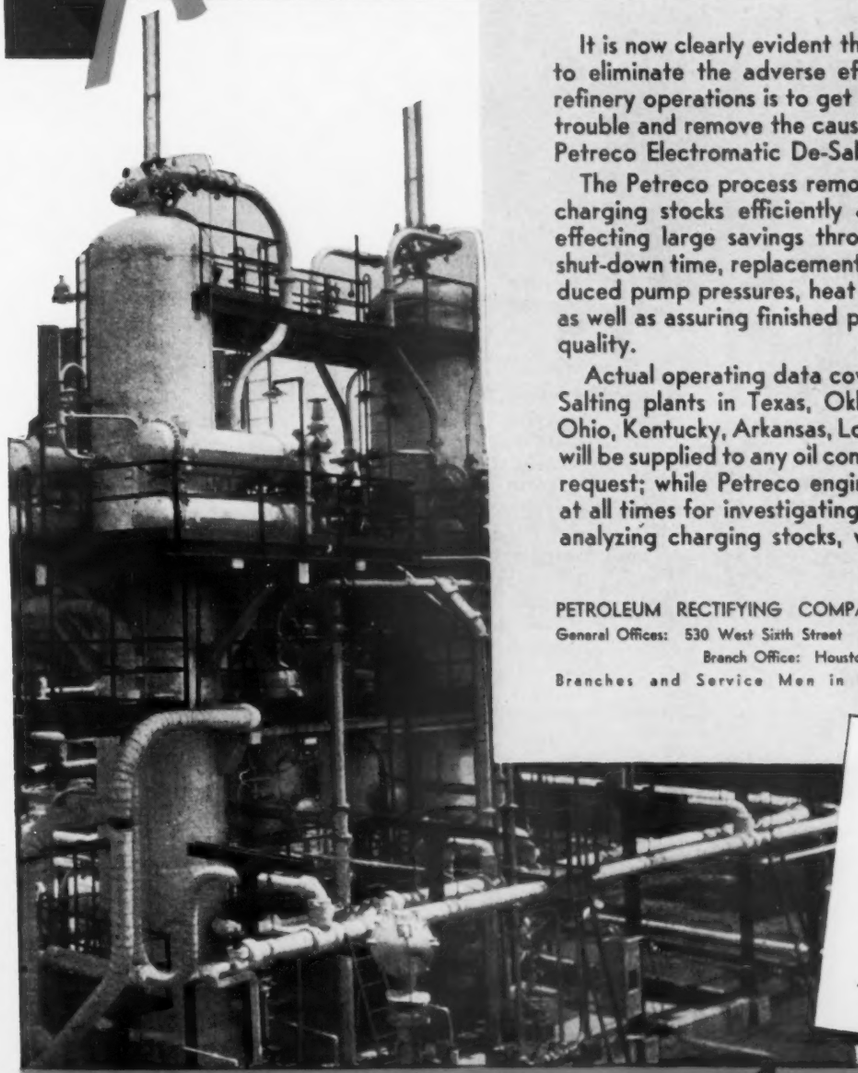


Fig. 4. Pumps and piping assembly in Barnsdall's copper unit

. . . . . TO ELIMINATE THE ADVERSE EFFECTS OF SALTS ON REFINERY OPERATIONS

Remove THE CAUSE



It is now clearly evident that the logical way to eliminate the adverse effects* of salts on refinery operations is to get to the root of the trouble and remove the cause by means of the Petreco Electromatic De-Salting Process.

The Petreco process removes the salts from charging stocks efficiently and economically; effecting large savings through reductions in shut-down time, replacement of equipment, reduced pump pressures, heat losses, labor, etc.; as well as assuring finished products of highest quality.

Actual operating data covering Petreco De-Salting plants in Texas, Oklahoma, Michigan, Ohio, Kentucky, Arkansas, Louisiana and Kansas will be supplied to any oil company executive on request; while Petreco engineers are available at all times for investigating salt problems and analyzing charging stocks, without obligation.

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4. The deleterious effects of salts on refined and residual products.

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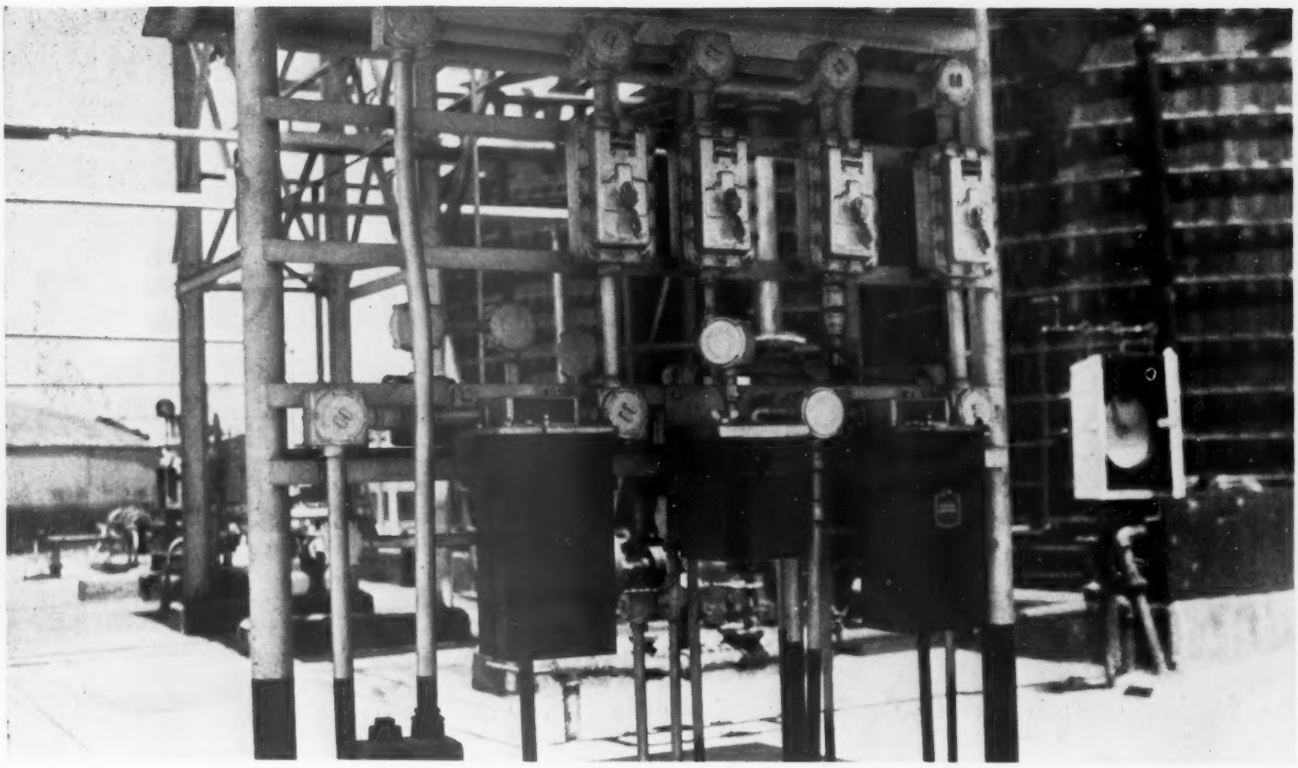

Fig. 6. Pump controller station at the Perco treating units

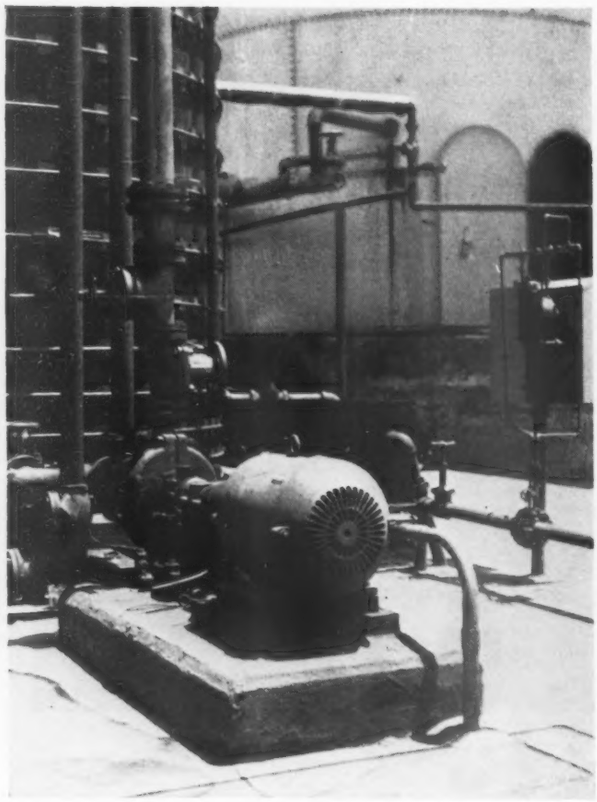

Fig. 3. Durichlor centrifugal pump handling cracked gasoline and copper chloride solution in equal proportions

ventional methods. Gasoline leaving the top outlet connection of the stabilizing tank is run directly to storage, sweet and noncorrosive.

Straight run gasoline, treated by the solid method, requires a caustic wash to remove H_2S which is present in considerable amount. This is taken from the pipe still accumulator drum as rapidly as manufactured by a pump which delivers it to the caustic contacting pump at the treater. Gasoline and prewash solution in equal volumes are taken through the suction connection and the mixture is discharged into the solution tank for primary settling, or breaking. A second tank, 10′ x 20′, was installed as an additional settler so that practically no trace of alkaline solution would appear in the stream of distillate leaving the outlet. The prewash solution contains caustic and alkaline polysulfide which removes the H_2S and any elementary sulfur before the gasoline reaches the solid copper treating tanks. The volume handled by this pump is approximately 200 bbls. per hour, half of which is gasoline. Caustic solution is recycled continually, with the first vessel approximately one third full, and the prewashed gasoline leaves the top of the second tank into piping leading to the solid treater. Two vertical vessels were installed for this type of gasoline treating, each containing approximately four tons of copper reagent which comprises liquid copper solution adsorbed on a carrying agent, such as fuller's earth. The reagent is supported upon a mat of hair felt laid on a perforated false bottom so that a void would be formed in the lower part of the vessel. The piping was made up with a manifold so the gasoline could be directed to either of the tanks as desired, and entering at the top or bottom as desired.

At the inlet of the manifold, air is introduced into the gasoline and carried in solution in the gasoline as it enters the chemical bed. The air jet terminates with an alundum diffusing cone around which the gasoline flows as the air comes in contact with it. Gasoline may be removed from either end of the treating vessel, depending upon the method of operation, and flows to storage sweet and noncorrosive and ready for shipment.

A problem of importance to the economical operation of either the solution or solid method is the preven-

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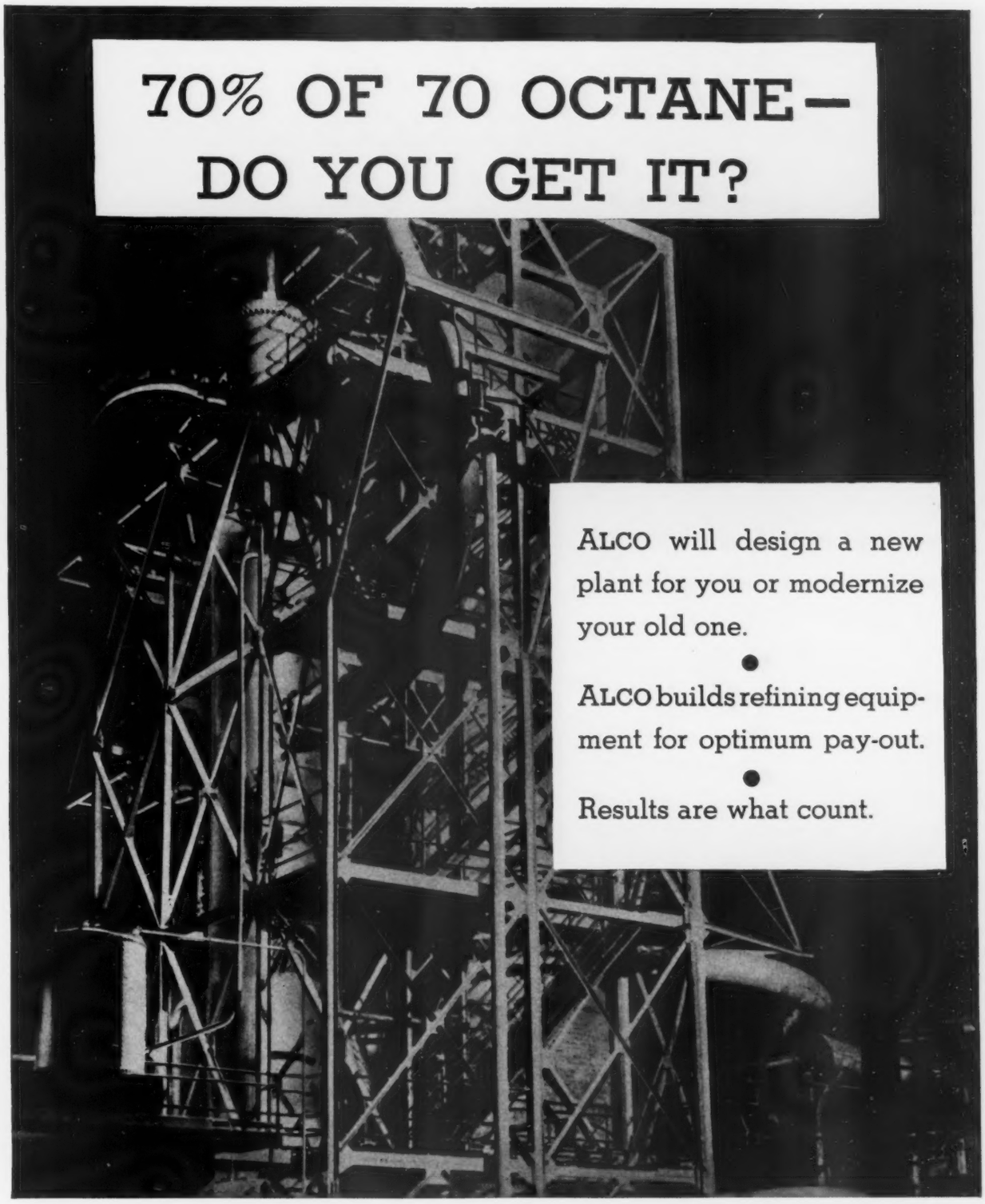

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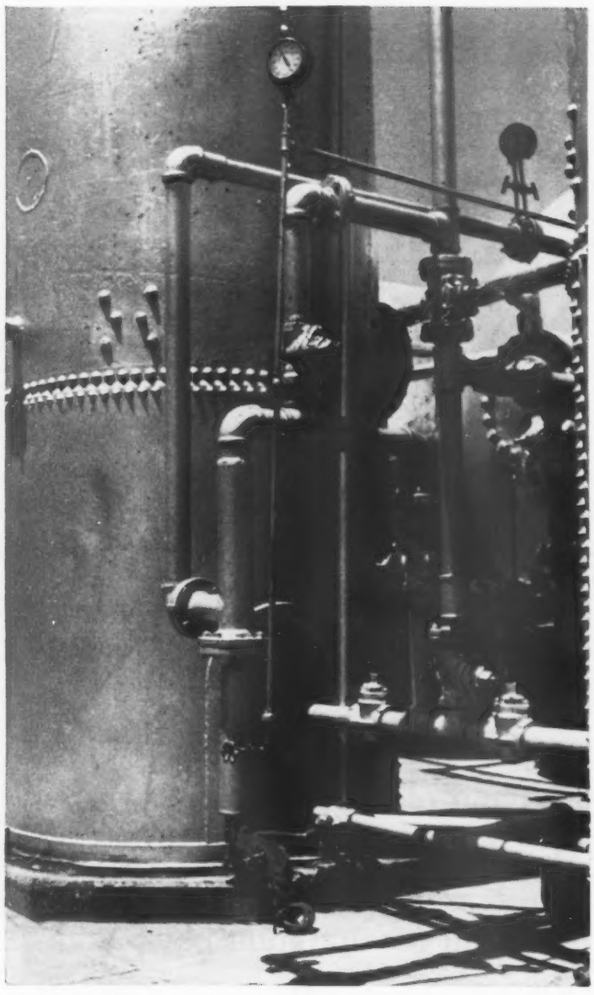


Fig. 5. This "case" contains the alundum diffusing cone, and air and gasoline piping in the Barnsdall unit

tion of appreciable carry-over of pre-caustic treating solution. Hydrochloric acid is formed in the first step in the reaction between the copper solution and the mercaptans and is used up again in the regeneration step. If caustic is carried mechanically into the copper solution then an equivalent amount of acid must be added to neutralize the caustic. No acid is added to the solid reagent. Tests are made regularly to determine the condition of the copper solution, employing a platinum electrode and a calomel half cell for the potentiometric determination of the oxidation potential. The pH of the solution is maintained within proper limits for economical operation.

Inspection of the condition of the solid treating reagent is more difficult, due to the fact that it is held in closed vessels, but gasoline is checked periodically for doctor tests and copper strip corrosion.

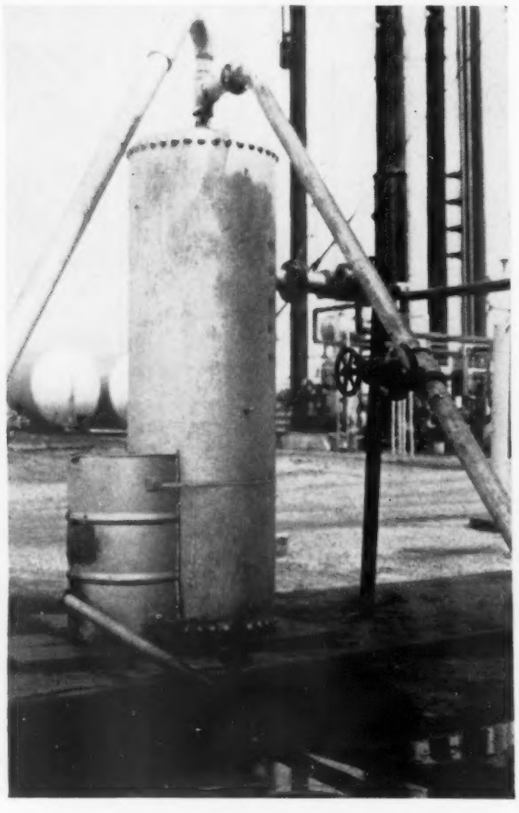
Installation of these units has resulted in a marked improvement in the quality of the products. There is no octane number loss in treating either the straight-run or the cracked, whereas the former method was responsible for considerable octane losses. Gum inhibitor is added to the cracked gasoline after treatment, and the quantity necessary to meet our induction period specification has been reduced about 20 per cent since the gasoline has been copper sweetened. The reduction in gasoline loss due to the change in treating methods has also been reflected in an improvement in overall plant yields.

Costs of operation have shown a progressive reduction each month since the unit was installed, primarily because of minor improvements in the pre-caustic washing operation. Treating costs in May and June, 1937, including labor and chemical on a per barrel basis, were reduced about 70 per cent as compared with the costs for the same two months last year when doctor treating was employed. One man per shift handles the treating plant, which is operated continuously. Furthermore, very substantial savings have been made because of the improved octane number and lowered TEL requirements as well as through the elimination of the loss in gasoline formerly encountered in doctor treating. During May and June, 75,498 barrels of cracked gasoline were treated in the solution treater.

Water—, Fire-Proof Frost Box In Gasoline Plant

In solving the frost box problem, Barnsdall Oil Co. has installed in its Earlsboro gasoline plant equipment that is permanent, efficient and has a good appearance. Oil drums were used to make these boxes, by cutting out portions to fit the particular scrubber or tank which requires protection. Where the drain gate was placed reasonably close to the body of the scrubber, the drums were placed vertically, with parts of the side cut away to conform to the curvature of the vessel to which they were attached. Lugs were welded on the side of the drums so that straps might be used to clamp them tightly to the scrubber to prevent rain or snow from entering.

A small door was made opposite the gate wheel so the operator may reach in and open when bleeding out the condensate. The material used to prevent freezing is cotton seed hulls, which when kept dry are said to be more efficient as insulation than barn yard manure so extensively used throughout the oil fields.



Oil drums filled with cotton-seed hulls serve as a protection for drain valves, etc., in Barnsdall's Earlsboro gasoline plant

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Patent Literature

In Refining Technology

By J. H. BYERS

VI. Synthetic Lubricants

A. Additives

THE search for new materials, the utilization of waste products, efforts to improve lubricants, and reduce operating costs, are contributing factors in the development of synthetic lubricants. For the most part the advance steps in this development have been taken by those whose records appear in the issued patents.

Lubricants have been classed as follows:

I. Straight mineral oils.

II. Oils with additives, such as soaps, graphite, fatty acids and fatty oils.

III. Synthetic lubricants.

The latter are oils or oily substances, produced as the name implies, by synthesis. They are distinguished from mineral oils produced by separation of petroleum into its constituents, as by distillation, filtration, settling or centrifuging acid treatment, solvent extraction, or other means in which successive portions are eliminated and desired fractions retained by analytical procedures. Synthetic lubricants are built up from simpler molecules, by processes involving condensation and polymerization.

Between classes II and III there is a transitive group, synthetic additives. These are transitive in a very real sense. They represent the opening wedge which synthetics are driving into the petroleum industry. In other words, while the use of synthetic oils as substitutes for petroleum lubricants hovers in the background, synthetic additives are already in the crank case.

The following conclusions seem warranted:

(1). Synthetic oils as straight lubricants will not supplant petroleum oils over-night.

(2). Synthetic oils constitute available substitutes for mineral oils and will be used as such when conditions permit. Technical barriers have been removed by research. It remains for economic conditions to justify large scale use.

(3). As additives, synthetic oils already are on the market.

Synthetic oils can be produced from a wide variety of sources. Those obtained from vegetal and chemical sources are stressed in this digest. Those more directly of petroleum origin will be covered in a digest to follow. The additive feature is most pronounced in the present group.

Hard and fast rules of classification would dictate maintenance of and rigid adherence to strict and logical lines. This is an ideal, unattainable objective. Patent disclosures are heterogeneous, invention constantly bridges preconceived gaps. Developments refuse to follow paths laid out by armchair prophets, and inventors insist on crowding into one patent enough material for four.

All of which has from time to time led to the preparation of patent digests by parties, who repreatedly discover they have bitten off more than they can chew. This denouement always gratifies both the pessimists who maintain that it is impossible to bring the patents out of hiding, and the optimists who like their patents lurking around in dark corners.

However, it is pretty well agreed at present that at least the reclassification which the Patent Office is undertaking is a desirable thing. And there are a few visionaries who see the time when the difficulty classifiable chemical patents will all be digested and abstracted. Un-

Abstract

● Forty patents covering the application of synthetic materials as additives to lubricating oils are summarized by this authority on patent literature, to sum up the entire picture for the busy technologist. Another article in this series, on synthetic lubricants, will appear shortly.

Lubricants are classed into three groups; straight mineral, mineral with additives, and synthetic lubricants. The class discussed in this sixth article the author calls a transitive class between the second and third classes.

This article covers such phases as methods of synthesis, briefly; also raw materials, catalysts, etc. Many materials are used for pour point depressants, viscosity and V. I. improvers, and film strength additives. Some patents issued on pour depressants since Dec. 2, 1936 are here included and these bring that earlier list (N.P.N. Dec. 2, '36, p. 83) up to date.

One statement of the author is significant; " *****Inventors insist on crowding into one patent enough material for four."—Ed.

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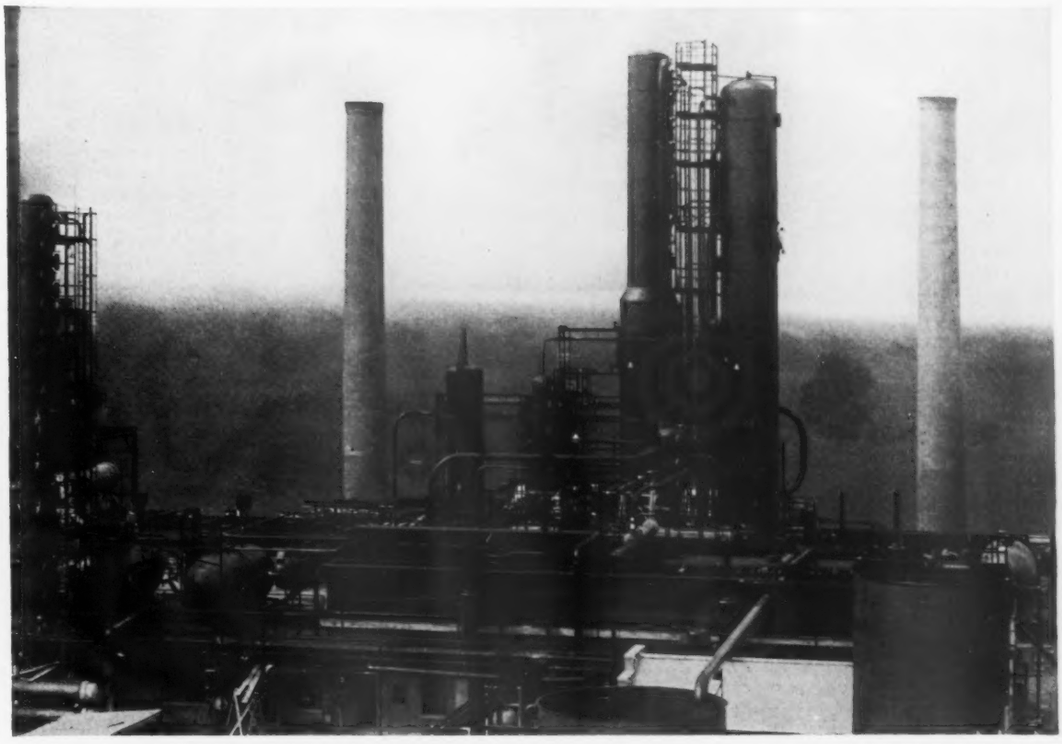

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doubtedly digesting all chemical patents would prove a task of formidable proportions, but it is not impossible, and before another million patents or so are issued it will be a necessity. At present short reviews of patents afford one way of gaining a perspective view of patents in active fields.

The subject of synthetic lubricants is one which, together with synthetic fuels, has been extensively investigated. In short space it is possible to survey the technological development only briefly.

Methods of producing these new substances are varied, choice of raw materials is wide, and results are flexible. Methods of promoting the necessary reactions involve application of heat and pressure and contact with catalysts. High tension electric discharges, irradiation with light of short wave lengths, also have been used. Continuous removal of certain products causes reaction to proceed in the desired direction.

Aluminum chloride is the most commonly employed catalysts, but also silicon, titanium, tin, phosphorus, bismuth, iron and boron chlorides may be used, and some inorganic acids and activated earths.

Polymerization reactions, being exothermic, are favored by low temperatures. Catalysts accelerate polymerization. Silent electric discharges, however, cause polymerization without catalysts.

The raw materials from which synthetic lubricants can be produced are quite varied, and comprise coal, materials of petroleum origin, animal and vegetable oils and also pure chemical substances. In general unsaturated hydrocarbons, especially olefines, are well suited to polymerization. These hydrocarbons are formed in cracking operations and include both liquid and gaseous products. Cracking gas, produced in cracking processes for the conversion of high-boiling distillates into low-boiling liquids of the gasoline type, is an example of by-products which can serve as a source of synthetics. Coal can be thermally decomposed into various substances capable of polymerization, condensation and hydrogenation.

Natural gas has potential utility. Ethylene, $CH_2:CH_2$, has been polymerized to a liquid of lubricant viscosity. Fatty oils are polymerized by Ellis, 1,179,414, and Cabot, 1,935,588. Glycerine is polymerized by Noack 2,015,867. Other patents disclose condensation products obtained by reaction between fatty acids or fatty oils and hydrocarbons.

Pour point lowering is one of the more important functions of the synthetics covered in the appended patents. For example, Schumann, Muench and Ufer, 2,020,703, Wulff and Brewers, 2,020,714, van Peski, 2,022,990, 2,073,080, Limburg, 2,023,369, Moran, 2,043,836, Reiff and Badertscher, 2,048,465, 2,048,466, 2,052,003, 2,061,008, 2,062,676, 2,062,677, Davis, 2,055,482, Liberthson, 2,073,641, Ralston and Christensen, 2,077,068, Wade, 2,081,518, and Towne, 2,086,399.

Improvement in the viscosity index is an important object.

"In the production of high grade lubricating oil, it is

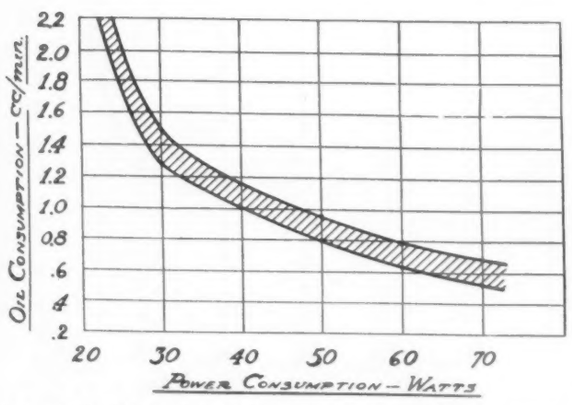

Fig. 2. Graph showing relation between oil consumption and power consumption in a journal bearing when used in connection with normal hydrocarbon lubricating oils and ordinary blended oils. (Fig. 1, Zimmer and Carlson, Pat. No. 2,074,039)

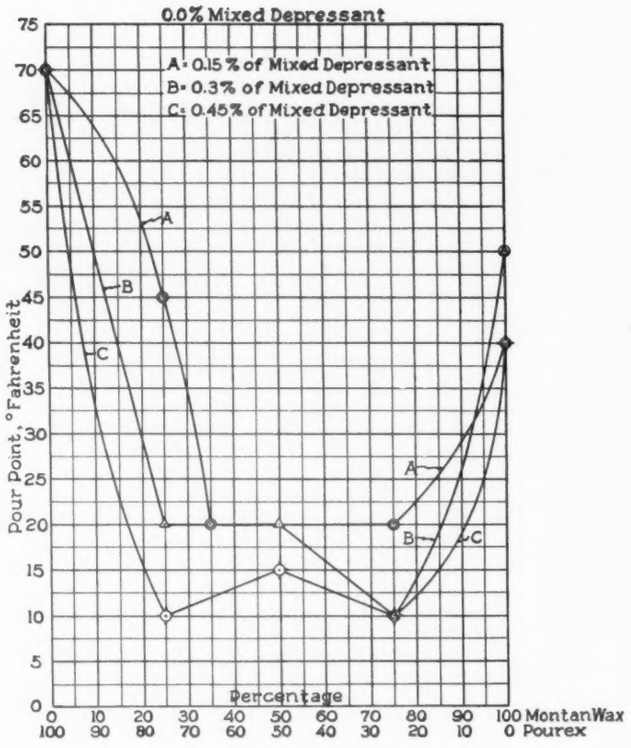

Fig. 1. Graph showing the effect of mixtures of Pourex and montan wax on the pour point. The mixtures are more effective than the pure substances. (Wade, Pat. No. 2,081,518)

well known that a relatively small change in the viscosity of the oil between temperatures of say 100 degrees F. and 210 degrees F. is desirable. In other words, it is advantageous for the oil to have a relatively flat viscosity-temperature curve, which means that the oil has a high viscosity index as defined by Dean and Davis in their article in Chemical and Metallurgical Engineering, Vol. 36, page 618. Improvement in lubricating oils has heretofore been accomplished by chemical or solvent refining as by the use of sulphuric acid or selective solvents. The latter process is effective in extracting or separating naphthentic constituents from paraffinic constituents, thereby producing a resulting raffinate of increased viscosity index. This procedure involves expensive processing, and results in a reduced yield of finished oil.

"The present invention relates to the increase in viscosity index of naphthene base or paraffin base lubricating oils, by the addition thereto of a small proportion of a material which is active to increase the viscosity index without objectionally affecting the other desirable properties thereof. More particularly, the present invention relates to the production of an improved lubricating oil of this type having an increased viscosity index, by the addition thereto of a controlled proportion of synthetic resin which is the reaction product of rubber with certain amphoteric metallic halides or halogen acids." (Towne, 2,078,472. See also Towne, 2,086,399).

Wulff, Moll and Breuers, 1,998,350, disclose a number of examples of which the example shown in the table is typical. V.I. is the Dean-Davis index. In patent No. 2,020,714, polymerized products of fatty acid vinyl esters are used.

Schumann, Muench and Ufer, 2,020,703 find that the viscosity index and other properties, not only of lubricating oils but also of greases, benzines, paraffin waxes and the like are improved by polymerization products of vinyl ethers of unsaturated alcohols. Zorn, Hofmann and Rosinsky, 2,025,490 obtain valuable lubricating oils having the character of mineral lubricating oils from vegetal substances by converting them into unsaturated products and condensing them. The oils are themselves of flat temperature-

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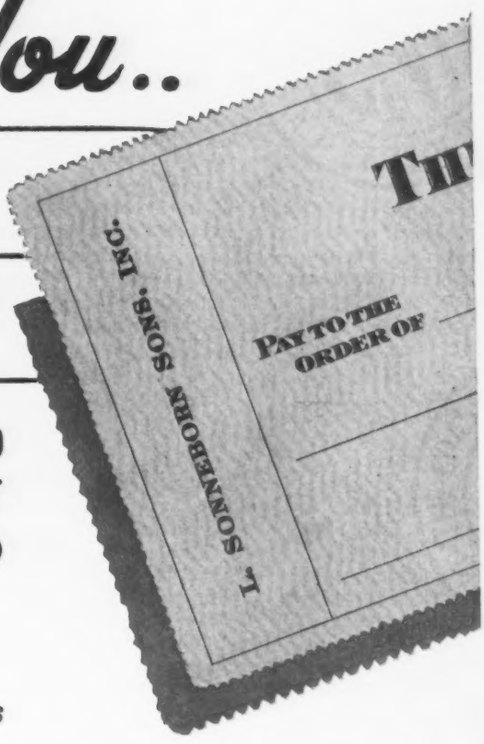

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viscosity curve and may be added to other oils to improve them. Pier, Christmann and Donath, 2,028,349 and 2,049,019, use high molecular weight hydrocarbons, or compounds obtained by a splitting hydrogenation of polymerization products of unsaturated hydrocarbons, to increase the viscosity index. Mikeska and Fulton, 2,072,120, alkylate a resin to render it soluble in oil, wherein it improves the viscosity index. Wiezevich, 2,079,783, includes aliphatic linear polymers to improve viscosity characteristics.

Simple increase in viscosity is an objective in the addition of synthetics. Wiezevich, pat. No. 2,079,783, states for example that while aromatic compounds possess beneficial features which are not present in many oils now used as lubricants such as high temperature stability, high autoignition temperatures, low oxidation rate, etc., they have the disadvantage of low viscosity. For improving the viscosity, iso-butylene polymers, hydrogenated poly-vinyl acetylene, polychlorprene, poly-vinyl esters, ethers, and ketones, cellulose esters and ethers, glyptals and bakelite resins, petroleum resins, and voltolized compounds, etc., are added. Other patents directed to thickening oils are Ellis, 1,179,414, Wulff, Moll and Breuers, 1,998,350, and Mikeska & Fulton, 2,072,120.

Improvement in the film characteristics is shown by Lincoln and Henriksen patents 1,939,979, 1,939,993, 1,939,994 and 1,939,995; and by Ralston, Christensen and Selby, patents 2,033,543, 2,033,546, and 2,077,068. The agents used are condensation products of fatty acids and esters. These form codensation products per se as in pat. No. 1,939,994, or may be reacted with aromatic or waxy hydrocarbons. Pat. No. 1,939,979 claims a chlorinated fatty acid-diphenylene oxide condensation product. These various agents may have oiliness or extreme pressure characteristics dependent apparently on the fatty acid radicals and chlorine content.

Noack, 2,015,867 prepares explosion proof lubricants from polymerized glycerine. These are used on bearing surfaces which may be exposed to oxygen, such as valves, stopcocks, compressors and welding burners.

In the following abstracts the data is given thus: name of inventor, serial number of the patent, name of the assignee, if any, date of issue of the patent, and example of the subject matter. The period covered includes July, 1937.

Some of the patents below have been included in prior digests. A number relate to pour depressors issued since the preparation of the list published in the NATIONAL PETROLEUM NEWS of Dec. 2, 1936, and may be referred to, in order to bring that list up to date.

U. S. Patents

1. Ellis, 1,179,414. Apr. 18, 1916, Ultra-violet radiation polymerizes fats and oils to produce thickened products, useful as additives in mineral oil lubricants.

2. Cabot, 1,935,588. Polygon Products Co. Nov. 14, 1933. A material having good lubricating properties has added thereto a relatively small proportion of a polymer thereof, the same being iso-colloidally dispersable in the original lubricating material. Although the present invention is particularly satisfactory for treatment of petroleum oils of the character set forth, it may be used in connection with other organic lubricants, and particularly the semi-drying oils and hydroxy animal or vegetable oils or greases.

3. Henriksen and Lincoln, 1,939,979. Continental Oil Co. Dec. 19, 1933. A lubricating oil comprising in combination a hydrocarbon oil and a small percentage of a chlorinated fatty-acid-diphenylene oxide condensation products. Improves film strength.

4. Lincoln and Henriksen, 1,939,993. Continental Oil Co. Dec. 19, 1933. A lubricating oil comprising in combination a hydrocarbon oil and a small percentage of the halogenated condensation product obtained by condensing a fatty oil with an aromatic hydrocarbon. This provides oiliness.

5. Lincoln and Henriksen, 1,939,994. Continental Oil Co. Dec. 19, 1933. A hydrocarbon oil containing a small quantity of the condensation product of a chlorinated ester or fatty acid. Alkaline condensing agents are used. High film strength is imparted.

6. Lincoln and Henriksen, 1,939,995. Continental Oil Co. Dec. 19, 1933. The condensation product of a chlorinated wax and a chlorinated fatty acid is added to a hydrocarbon oil to improve film-forming characteristics.

TABLE I

Table showing viscosity (Engler) and viscosity index (Dean & Davis) of straight lubricating oils and oils containing hydrogenated polymerized styrene. (Example 6, 2d col. lines 28 to 44, Wulff, Moll and Breuers, 1,998,350)

	Degrees Engler at 38° C.	50° C.	98° C.	V. I.
Lubricating oil without addition..	19.71	9.61	1.93	36
Lubricating oil with an addition of 1 per cent of hydrogenated polymerized styrene	22.26	10.42	2.10	60
When these products were heated for 3 minutes to 300° C. the corresponding values were:				
Lubricating oil without addition..	18.70	8.61	1.89	37
Lubricating oil with an addition of 1 per cent of hydrogenated polymerized styrene	22.28	10.78	2.18	73

7. Wulff, Moll and Breuers, 1,998,350. I. G. Farbenindustrie Aktiengesellschaft. Apr. 16, 1935. A lubricating oil is improved by addition of at least 0.5% polymerized styrene. Related polymeric hydrocarbons are used. The viscosity characteristics are improved.

8. Noack, 2,015,867. Oct. 1, 1935. Explosion-proof lubricants are composed of highly polymerized glycerines, with or without suitable additions.

9. Schumann, Muench and Ufer, 2,020,703. I. G. Farbenindustrie Aktiengesellschaft. Nov. 12, 1935. The properties of hydrocarbon products, especially lubricating oils, also greases are improved in setting point and viscosity index by incorporating polymerization products of vinyl ethers of unsaturated alcohols, if desired together with or in admixture with polymerization products of vinyl ethers of saturated alcohols.

10. Wulff and Breuers, 2,020,714. I. G. Farbenindustrie Aktiengesellschaft. Nov. 12, 1935. With lubricating oils, highly polymerized vinyl compounds containing oxygen, to increase viscosity, lower setting point and flatten the temperature-viscosity curve.

11. Van Peski, 2,022,990. Shell Development Co. Dec. 3, 1935. A condensation product of a saccharose having at least one cyclic nucleus and not more than two monosaccharose groups in its molecule and an aliphatic acid, is added to lubricants to lower the pour point.

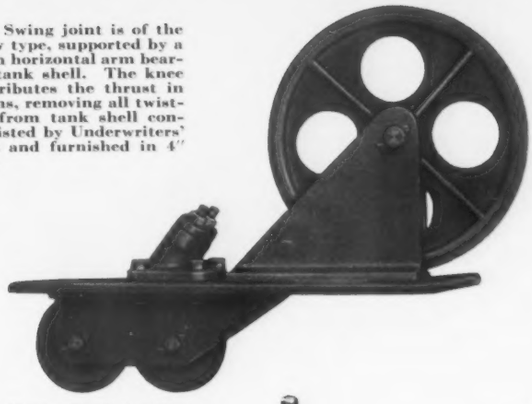
12. Limburg, 2,023,369. Shell Development Co. Dec. 3, 1935. Condensation products of cyclic hydrocarbons, or their hydroxy and other substituted derivatives or hetrogeneous ring compounds with N or O in the ring, with paraffinic hydrocarbons or various other open chain compounds such as higher fatty acids, aliphatic alcohols, etc., yield on extraction concentrated pour point reducing agents. The extraction is effected by means of adsorbing agents, and in some cases with the aid of solvents or distillation.

13. Zorn, Hofmann, and Rosinsky, 2,025,490. I. G. Farbenindustrie Aktiengesellschaft. Dec. 24, 1935. As initial materials there are used vegetable or animal fats or fatty oils, such as soya bean oil, olive oil, palm oil, bone oil and the like. Unsaturated conversion products are obtained by heating, preferably with catalysts and under pressure. These unsaturates are condensed by a Friedel-Crafts reaction. Result is a viscous lubricating oil having a flat temperature-viscosity curve, which may be added to other lubricating oils to improve them.

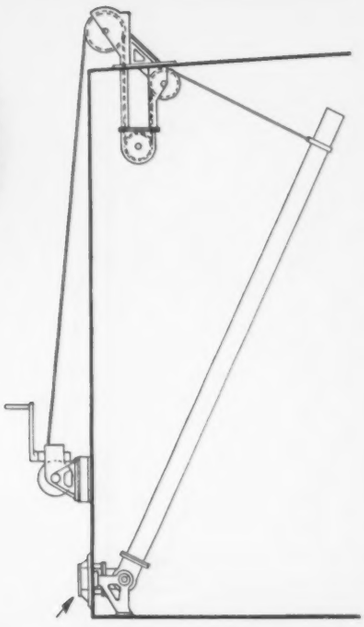
14. Pier and Christmann, 2,028,349. I. G. Farbenindustrie Aktiengesellschaft. Jan. 21, 1936. A waxy lubricating oil containing added polymerization products of unsaturated hydrocarbons capable of forming polymeric homologous series, the products obtainable therefrom by hydrogenation, isomerization, hydrogenated rubber, hydrogenated resins, hydrogenated balata and hy-

S&J Furnishes Complete Swing Line Equipment

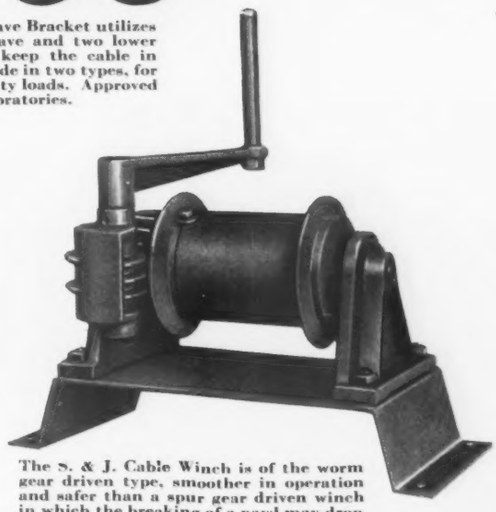
The S. & J. Swing joint is of the double elbow type, supported by a pedestal with horizontal arm bearing on the tank shell. The knee bracket distributes the thrust in two directions, removing all twisting strains from tank shell connections. Listed by Underwriters' Laboratories and furnished in 4" to 24" sizes.



The S. & J. Cable Sheave Bracket utilizes an upper or load sheave and two lower guide sheaves which keep the cable in proper alignment. Made in two types, for ordinary and heavy duty loads. Approved by Underwriters' Laboratories.



The drawing above illustrates the assembly of an S. & J. Swing Line on a gas tight tank, utilizing the cable sheave case illustrated below



The S. & J. Cable Winch is of the worm gear driven type, smoother in operation and safer than a spur gear driven winch in which the breaking of a pawl may drop the swing line and damage the tank bottom. No danger of a spinning handle. Available in three sizes, uniform in design, quality of workmanship and materials.

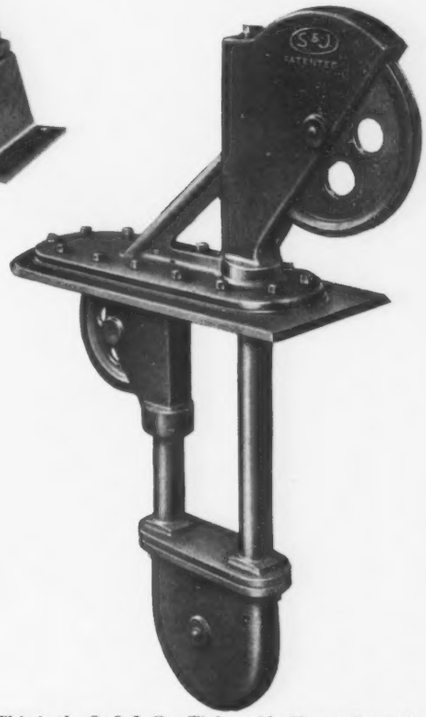
REFINERS who have standardized on S. & J. Storage Tank Fittings have often commented that S. & J. swing lines "work like a charm."

There is a definite reason for their uniformly satisfactory operations and that is because all of the component parts were designed and built to be used together.

When a swing line is built up of units of several different makes, the user fails to obtain the "balance" of a swing line furnished by one manufacturer.

On this page, we show the several members of the S. & J. Swing Line—each one reflecting the quality construction that has long been characteristic of S. & J. fittings.

The S. & J. Swing Line Nozzles are unique in that they obviate the expense of emptying a tank to stop a leak. They are of the three flange type, cast in one piece and all caulking to secure a tight joint is done from the outside. Listed by Underwriters' Laboratories and available in sizes for 2" to 24".



This is the S. & J. Gas Tight cable Sheave Case, the only piece of equipment on the market that will positively hold the pressure within tanks without loss of gases held under pressure. Made for conical, dome, or water top tanks, patented and listed by Underwriters' Laboratories.

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drogenated gutta percha, to increase the viscosity and flatten the temperature-viscosity curve and also containing added volatilization products and condensation products of paraffinic and cyclic hydrocarbons. The viscosity improving agents include polymerized styrene or indene, and cellulose derivatives such as cellulose laurates.

15. Ralston and Christensen, 2,033,543. Armour and Co. March 10, 1936. A ketonic substance obtained by reacting anthracene oil with higher fatty acid chlorides by the Friedel-Craft's synthesis contributes oiliness to lubricating oil.

16. Ralston, Christensen and Selby, 2,033,546. Armour and Co. March 10, 1936. An improved lubricant containing a small amount of the Friedel-Craft's reaction products of higher fatty acid chlorides and coal tar fractions.

17. Moran, 2,043,836. Socony-Vacuum Oil Co. June 9, 1936. Pour point depressants are produced by reaction in the presence of aluminum chloride of oleic acid, an alkyl dichloride, and an aromatic hydrocarbon.

18. Reiff and Badertscher, 2,048,465. Socony-Vacuum Oil Co. July 21, 1936. As a pour depressor an ester of an organic carboxylic acid and a wax-substituted hydroxy aromatic compound.

19. Reiff and Badertscher, 2,048,466. Socony-Vacuum Oil Co. July 21, 1936. As a pour depressor, a phthalic ester of a heavy alkyl substituted phenol.

20. Pier, Christmann and Donath, 2,049,019. I. G. Farbenindustrie Aktiengesellschaft. July 28, 1936. Compounds obtained by a splitting hydrogenation of polymerization products of unsaturated hydrocarbons capable of forming polymeric homologous series or products obtainable therefrom by isomerization, as for example rubber, or polymerization products of olefines, such as butylene, isobutylene or styrene, or natural or artificial resins at temperatures above 300° C. and which have lubricating oil character, are added to lubricating oils of low viscosity to increase the viscosity and the viscosity index.

21. Reiff, 2,052,003. Socony-Vacuum Oil Co. Aug. 25, 1936. As a pour point depressor a resinous condensation product of aromatic hydrocarbon material and aliphatic hydrocarbon material of relatively high molecular weight, condensed together and further condensed with a resinifying agent capable of resinifying the aromatic hydrocarbon material.

22. Davis, 2,055,482. Standard Oil Development Co. Sept. 29, 1936. As a pour inhibitor a polymer containing oxygen, prepared by low temperature oxygen treatment of an alcohol having a long hydrocarbon chain of at least 10 carbon atoms, whereby said polymer is produced along with other oxidation products, separating the unconverted alcohol and said other oxidation products by distillation and recovering the polymer as a residue.

23. Reiff, 2,061,008. Socony-Vacuum Oil Co. Nov. 17, 1936. As a pour point depressant a resinous condensation product comprising the reaction product of oxyaromatic

Huge Coking Drums Floated From Jersey To Indiana

These four huge coking drums, each weighing 175,000 pounds, too large for either railroad or steamer transportation, were recently launched into New York Bay at Jersey City, from the plant of M. W. Kellogg Co. They will be towed by the ocean-going tug shown, up through Hudson River, New York State Barge Canal, Lakes Erie, Huron and Michigan to the refinery of Standard Oil Co. of Indiana at Whiting, Ind.

They are lashed together with steel cables, with timber protective work covering manholes and other projections and heavy timbers bound alongside. Two tugs will be required to handle them through the canal. The cubic capacity of each is 8900 cubic feet, the wall thickness is 1 3/16 inches, and they will be installed in the new combination unit building at Whiting.

Monstrous as these drums are, they are dwarfed by a low-pressure evaporator which will be shipped in the same manner by Kellogg about Oct. 15, to Whiting. It is 80 ft. long, 15 ft. diameter, has 2 5/16-inch walls, and weighs 460,000 pounds! Unable to pass the Erie Canal between Syracuse and Buffalo, it will pass through the N. Y. State Barge Canal into Lake Ontario, thence through Welland Canal to Lake Erie, and by the same route as the drums to Whiting. So far as is known it will be the largest and the heaviest single piece of freight ever shipped.

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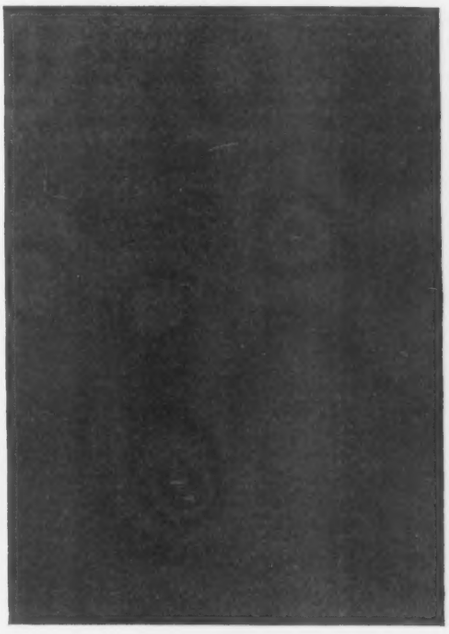

■ Because Thermal Polymerization Units utilize refinery by-product gases, natural gases, or varying combinations of both for the production of high octane motor fuels, their application is highly flexible.

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POLYMERIZATION

hydrocarbon material selected from the group consisting of hydroxyaromatic compounds and aromatic ethers, condensed with a resinifying agent capable of resinifying the oxyaromatic hydrocarbon material, and subsequently condensed with halogenated aliphatic hydrocarbon material of relatively high molecular weight in the presence of a catalyst.

24. Zimmer and Morway, 2,062,346. Standard Oil Development Co. Dec. 1, 1936. An oil soluble linear polymer of isobutylene having a molecular weight in excess of 30,000 is incorporated in a soap grease.

25. Reiff, 2,062,676. Socony-Vacuum Oil Co. Dec. 1, 1936. As a pour point depressant, a resinous condensation product comprising the reaction product of oxyaromatic hydrocarbon material selected from the group of compounds consisting of hydroxy aromatic compounds and aromatic ethers, condensed with halogenated aliphatic hydrocarbon material of relatively high molecular weight in the presence of a catalyst and subsequently condensed with a resinifying agent capable of resinifying the oxyaromatic material.

26. Reiff, 2,062,677. Socony-Vacuum Oil Co. Dec. 1, 1936. As a pour point depressant an oil-miscible synthetic resinous material produced by first treating a substance selected from the group consisting of naphthalene, anthracene, diphenyl, phenanthrene and fluorene with a resinifying reagent of aldehyde nature to form a resin, and subsequently condensing the resin product with chlorinated paraffin wax in the presence of a catalyst of the nature of aluminum chloride.

27. Brownback, 2,066,958. Jan. 5, 1937. A composition designed for use in sealing, coating or lubricating metallic or other surfaces composed of vegetable, fish or animal oil which is thickened by various methods including polymerization by light rays or high frequency electricity, and containing also fillers and other additions.

28. Blake and Seymour, 2,068,003. Celanese Corp. of America. Jan. 19, 1937. Textile material is treated with a lubricant containing a condensation product of formaldehyde, formalin, tri-hydroxy-methylene, butraldehyde or paraformaldehyde with a simple polyhydric alcohol.

29. Mikeska and Fulton, 2,072,120. Standard Oil Development Co. March 2, 1937. Resinous materials may be rendered soluble in hydrocarbon oils by alkylation. The resinous materials are prepared by the Fittig or Freidel-Craft synthesis; for example, high molecular weight products formed by reaction of alkyl dihalides with aromatic hydrocarbons; or styrene and indene polymerization products; or phenol formaldehyde resins; or resins prepared from phthalic anhydride, the naphthalene formaldehyde resins. Alkylation of the resin is conducted by any of the ordinary organic syntheses with an alkyl halide, or an olefine, or an alcohol. These alkylated resinous products are generally miscible in all proportions with hydrocarbon solvents, and may be used as thickening agents in lubricating oils, transmission lubricants, railroad car journal oils, slushing oils, and the like. Some of high molecular weight are viscosity index improvers.

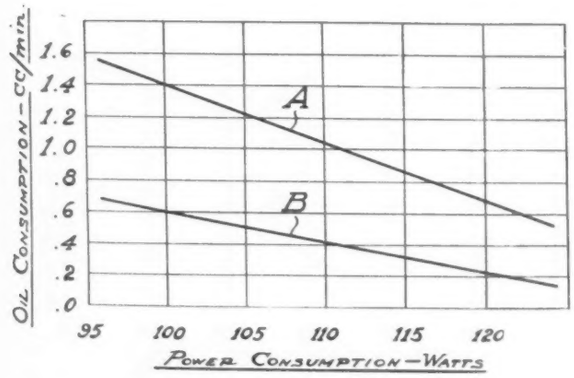

Fig. 3. Graph showing relation between oil consumption and power consumption in a journal bearing when used with mineral oil containing a linear polymer of isobutylene. (Fig. 2, Zimmer and Carlson, Pat. No. 2,074,039)

30. Van Peski, 2,073,080. Shell Development Co. March 9, 1937. As a pour point depressor the product obtained by the condensation of halogenated high molecular paraffinic hydrocarbons with highly condensed cyclic hydrocarbons selected from the group consisting of cyclic hydrocarbons having more than three aromatic or hydrogenated rings in their molecules, and concentrated solutions of such polycyclic hydrocarbons obtained by the condensation of extracts obtained in refining mineral oils containing cyclic hydrocarbons with selective solvents for non-paraffinic hydrocarbons.

31. Voorhees, 2,073,506. Standard Oil Co. (Indiana). March 9, 1937. Synthetic resins, termed "viscoresins", prepared by hydrogenation of rubber, or polymerization of olefines, are stable in use. The oils with which they may be compounded, however, may become unfit for further service. A process of recovering "viscoresins" is claimed.

32. Liberthson, 2,073,641. L. Sonneborn Sons, Inc. March 16, 1937. Lubricating oils having a low pour point and being substantially non-emulsifiable are prepared by adding an unsaponifiable material isolated from voltol.

33. Zimmer and Carlson, 2,074,039. Standard Oil Development Co. March 16, 1937. A lubricant adapted for low power consumption and leakage, containing an oil soluble linear polymer of isobutylene having a molecular weight in excess of 30,000. (See Figs. 2 and 3.)

34. Ralston and Christensen, 2,077,068. Armour and Co. April 13, 1937. Higher fatty acids are reacted in the presence of aluminum chloride or zinc chloride, with coal tar distillates to produce substances which impart oiliness and low pour point to lubricating oils.

35. Towne, 2,078,472. The Texas Co. April 27, 1937. Lubricating oils having increased viscosity index are prepared by addition of a minor proportion of a synthetic resinous product consisting essentially of the reaction product of rubber with a compound selected from the group consisting of halides of tin and boron, and halogen acids of tin and boron.

36. Wiezevich, 2,079,783. The Standard Oil Development Co. May 11, 1937. Aromatic base stocks are improved by a viscosity and viscosity index increasing agent. For improving the viscosity it is preferable to employ isobutylene polymers, also hydrogenated poly-vinyl acetylene, polychlorprene, poly-vinyl esters, ethers and ketones, cellulose esters and ethers, glyptal resins, bakelite resins, petroleum resins, thickened glycerides, poly-anhydrides and their esters, lactones and lactides, sulfurized products, voltolized compounds, etc. In cases where increase in viscosity index alone is desired, the base stock is blended with a material of high viscosity index, for example, animal, vegetable or fish oils. Pennsylvania or hydrogenated oils, dibutyl phthalate esters, etc.

37. Wade, 2,081,518. Union Oil Co. May 25, 1937. A pour point depressor is composed of two substances, (1) Montan wax or an ester of montanic alcohol and montanic acid. (2) an aromatic-aliphatic hydrocarbon Friedel-Crafts condensation product. Numerous other examples are given. (See Fig. 1.)

38. Liberthson, 2,084,352. Standard Oil Development Co. June 22, 1937. An improved electrical polymerization product acts as pour inhibitor.

39. Otto and Mueller-Cunradi, 2,084,500. I. G. Farbenindustrie Aktiengesellschaft. June 22, 1937. A grease. Example—a synthetic machine oil prepared by polymerization of cracking products is admixed with a polymerized hexene, cyclohexene, or turpentine oil. Saponified Montan wax gives grease characteristics.

40. Towne, 2,086,399. The Texas Co. July 6, 1937. Mineral lubricating oils having increased viscosity index and/or lowered pour point are prepared from the product disclosed in patent No. 2,078,472. The improvement consists in separating a desired component.

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Water Treatment

New water treatment gives temporary effect. Increase in water treatment follows trend to larger boiler units. A. R. Borden, Hall Laboratories, National Petroleum Assn. meeting, Bradford, Pa., June 3, 1937.

Threshold treatment and temporary undersaturation present a new and unique method of accomplishing continuity of clean condenser surfaces economically. Water having calcium carbonate hardness can be given temporary undersaturation by adding one or two pounds of sodium metaphosphate per million pounds of water as the water enters the cooling system.

All the results that could possibly have been secured by full treatment and permanent undersaturation were obtained at one plant where the system was tried out. First effects of application where an effluent water was about 160° F. was to remove old deposits. The temperature gradually increased up to 190° F. or more when the system was cleaned out. The threshold treatment is not applicable at higher temperatures such as is found in gas engine or diesel engine cooling.

The increasing use of water treatment has followed the trend in refinery modernization toward larger and more efficient boiler units. Because of the much greater investment involved they must have a higher availability factor than was required with the older and smaller units. Water conditioning methods now make possible operation of boilers for years without turbining of tubes as compared to a few months without the treating methods.

In spite of the wide variety of treatments available, selection of a method is a definite procedure determined from use requirements and impurities to be eliminated. The first step is to provide formation of sludge from water hardness instead of scale by use of phosphate. The second is prevention of corrosion which is provided by maintaining satisfactory alkalinity, getting rid of oxygen content, and providing against any embrittlement.

Alkalinity is increased by caustic or soda ash or decreased by an alkali-reducing phosphate. A heater of the open or de-aerating type removes much of the oxygen and an oxygen scavenger such as sodium sulfite finishes the job. Definite ratios of sodium sulfate to alkalinity expressed as sodium carbonate is recommended in the lower pressure boilers. For higher pressure boilers, the research program being carried on at the New Brunswick station of the U. S. Bureau of Mines as a joint research program with the Boiler Feedwater Studies Committee is pointing the way. In any event there is said to be no difficulty in setting up the prescribed ratio of sodium sulfate to alkalinity or other ratio in the boiler water for this purpose.

Quality of steam may be affected by mechanical features as well. For example maintenance of even water levels, continuous blowdown, correct baffling of the boiler drums, and steam purifiers. Alkalinity of boiler water must not become excessive and saponified organic materials must be excluded. It may be advantageous to employ a dispersive tannin in conjunction with carefully controlled phosphate concentration. The procedure was said to be merely a simple routine once established.

Laboratory tests include a titration of a boiler water sample for alkalinity. For sulfate determination, either titration or turbidimetric methods are available. Both these and the test for sulfite are definite and positive in the hands of a boiler operator or chemist. This type of procedure is applicable also to the smaller, older types of boilers.

Primarily treatment for the feedwater is variable and dependent upon several factors of water quality. Flexibility of the treating system is highly desirable from the standpoint of changing conditions.

* * *

Corrosion in Cracking Equipment

Three methods of making oil less corrosive in cracking units. R. E. Puckett, Oil and Gas Journal, Sept. 23. 1937.

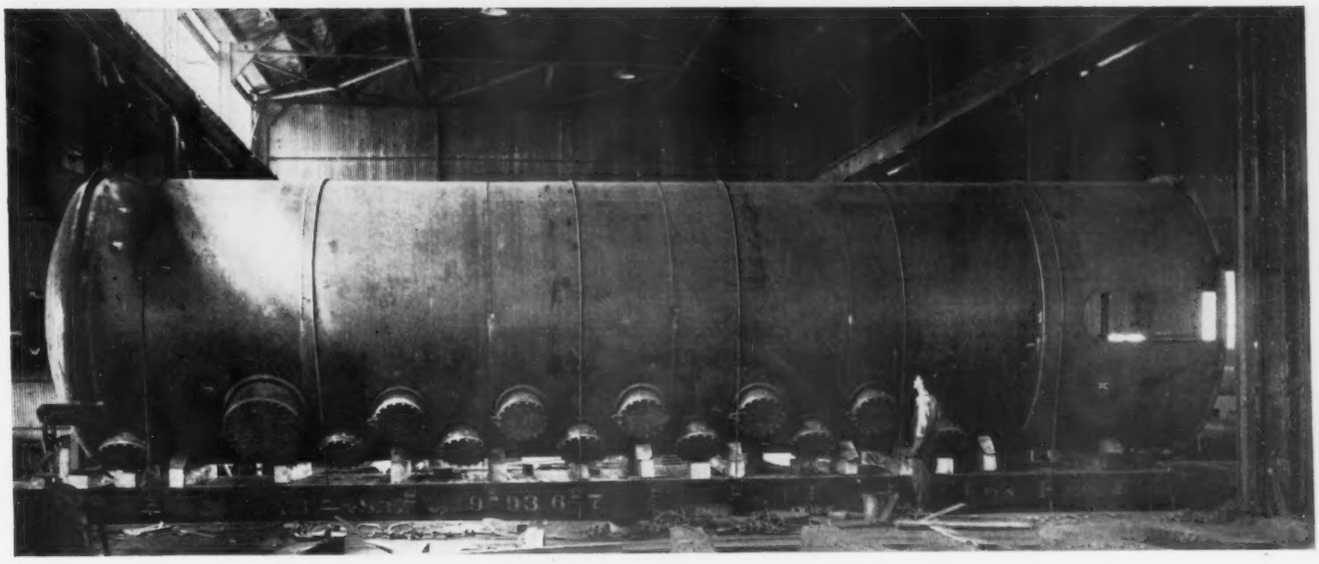
The use of ammonia gas was found to be of great assistance in the control of sulfur and acid corrosion in crude stills and in low-velocity cracking stills in the Wichita plant of the Barnsdall Refining Corp. Corrosive salts are being removed by water scrubbing followed by electrical dehydration. Corrosion in high-pressure cracking equipment has been reduced by a controlled lime dosage.

Following the initial injection of ammonia into the cold crude-oil charging pump, which was contrary to ammonia manufacturers recommendations, an immediate improvement was noticed in the crude still. The draw-off water ceased to run a stream of dissolved iron and the fractionating tower showed no further evidence of corrosion. Replacement of tubes in the cracking stills dropped about 75 per cent.

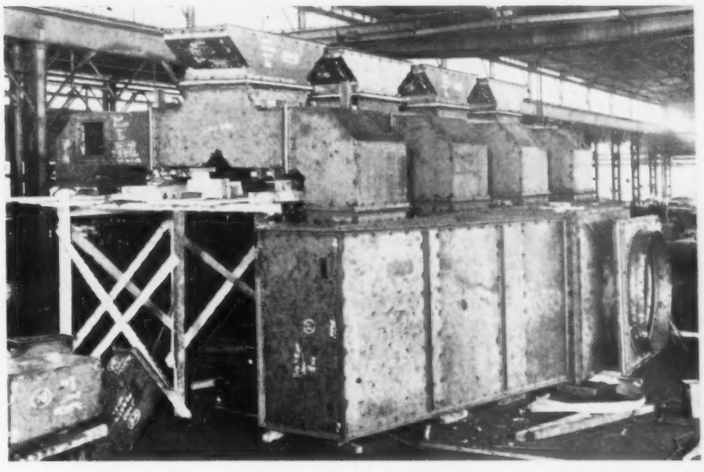
To accomplish this required about 8 pounds of ammonia per 1000 barrels of charge. In the crude furnace the maximum temperature was not over 750° F. and pressure was slightly above atmospheric. The tubes were carbon steel of 3½ inches inside diameter and the rate of flow was 3½ feet per second. The cracking unit was benefited unexpectedly even though the tube pressure was 200 pounds per square inch and maximum temperature was 900° F.

The only handicap experienced under alkaline conditions produced by the use of ammonia has been that iron chloride reacts with hydrogen sulfide to deposit iron sulfide in the fractionating tower with consequent stoppage of bubble caps and the small tubes in heat exchangers. Acid bearing crude should therefore be neutralized in the field to prevent contamination by iron salts.

The alkaline conditions result from a deviation in the value of the pH recommended by some authorities. A pH of 9 is the most desirable for the drawoff water from the condenser traps rather than around 6.7 which is near the neutral point. The factor limiting the use of ammonia gas for neutralizing sulfur corrosive compounds is the comparative low heat of formation of the



12′ x 51′-3″ Vacuum Steam Still 5/8″ Heads — 1/2″ Shell



(Above)—Breeching for Tube Type Heater

(Right) — Berquist Bins for Carbon Black Plant

For heavy refinery work, natural gasoline plant equipment and other oil industry installations, Wyatt Metal & Boiler Works offers two fully equipped plants. Total floor space is more than 200,000 square feet.

Steel Plate Fabricators and Erectors

WYATT METAL & BOILER WORKS
PLANTS AT DALLAS AND HOUSTON

sulfide. Excess ammonia will correct this weak point by the law of mass action.

An electrical system for removal of salt was installed and experience of six months makes it "quite safe to conclude that the electrical precipitation of salt from crude oils is one of the simplest and most effective ways of removing a corrosive factor."

Present lime dosage to maintain a tolerance of 0.2 pounds of hydrogen sulfide per 1000 cubic feet of still gas is 0.32 pounds of anhydrous lime per barrel. Lime dosage controlled to a definite hydrogen sulfide tolerance has been found to give excellent protection. The same charging stock which nearly destroyed the heavy oil furnace in a 16-day period has been run for 10 months with a tube-wall loss around 1/32 inch.

* * *

Acid Recovery

Acid recovery process accelerates decomposition of sludge and liberation of sulfur dioxide. S. F. Spangler, World Petroleum Congress, Paris, June 14-19, 1937.

Continuous thermal decomposition of acid sludge into sulfur dioxide and coke is accomplished in a rotary kiln through which hot combustion gases pass. Sulfur dioxide is purified and converted to acid using a vanadium catalyst.

Principal difficulty in developing the process was in purifying the sulfur dioxide gas before conversion to acid. The gas is mixed with combustion gases and water vapor as well as condensable and fixed hydrocarbons.

Excess water and condensable hydrocarbons are condensed in spray towers and scrubbers. Non-condensable fixed hydrocarbons are oxidized by passing the gas through a secondary combustion furnace heated by an oil burner and then cooling the gases by passage through additional scrubbers. Traces of acid mist formed in the second furnace are removed by passage of the gas through a Cottrell electric mist precipitator.

Sludge is decomposed by direct contact with heated coke produced by the process. Sufficient coke is burned in the kiln to heat the rest of the coke to the required degree and then introduced into the decomposing kiln. Surplus coke may be continuously withdrawn or, if deficient, can be made up by using auxiliary heat, such as an oil burner. In extreme cases sand may be kept in circulation instead of coke.

By this procedure there is no dilution of gaseous products of decomposition except to a small extent by infiltration of air. As a consequence, gases containing as much as 80 per cent of sulfur dioxide may be obtained. For lower percentages of hydrocarbons contact material is unnecessary, the hot gases being sufficient for conversion.

Inverting Compressor Engine Exhaust Lines

When Skelly's gasoline plant, known as "Carter Nine" was built during the height of activity immediately following the discovery of the Old Burbank Field in Osage County, Oklahoma, engines were installed which at that time were modern in every respect. However, as time flows along, improvements were made in design which included, among other things, the method of inverting power cylinders to enable the operators to establish a direct exhaust to the atmosphere, instead of following the custom of burying the lines beneath the ground.

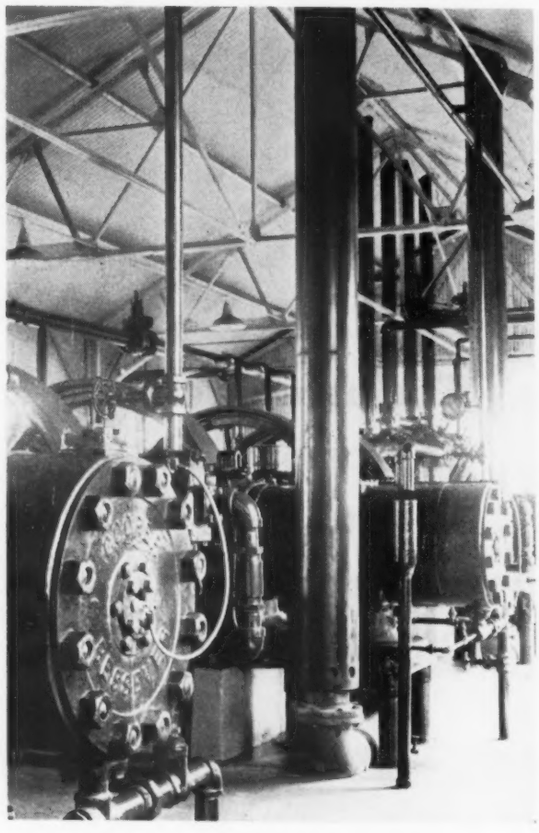
The older type of equipment was constructed in such a manner that converting them to overhead exhaust is not feasible, due to starting, air intake and other connections. Considerable difficulty has always attended underground exhausts, and many variations of placing exhaust pipes have been installed to prevent corrosion, rusting and fouling because of an accumulation of scale and mineral matter in the exhaust stool cooling water.

Recently, however, engineers in Skelly Oil Co.'s gasoline division have developed a system of 'inverting' the exhausts of these engines at a comparatively low cost, and attended with satisfactory operation. In the usual installation, the engines were set with the exhaust stools resting upon concrete foundations, with the 45-degree ell leading from short nipples, with couplings attached to piping so the lines could be buried at the desired depth beneath the floor. In this plant, the concrete blocks were chipped away with pavement breakers and supports made for the stool from short nipples of 4" pipe set in concrete grout poured in the holes drilled in the floor.

The usual short nipple was employed to bring the exhaust from the cylinder, but connected to an expansion joint to compensate for stresses due to heating when operating. The lower part of the joint was equipped with a second short nipple which in turn was flanged to a high tensile strength cast return bend whose chord was of sufficient length to extend well beyond the side of the power cylinder. Light weight pipe was flanged to the outer end of the return bend and extended through the roof of the building to carry the exhaust of the engine to the air in the same manner as obtained when operating one of the more modern engines of today's design.

To further extend the efficiency of the exhaust system on these converted engines, the piping was equipped with an air jacket, extending from the outer flange of the return bend to a point above the roof fittings of the building. Holes were placed in the extreme lower end of this packet to admit air for cooling the exhaust pipe, and to prevent excessive temperatures within the building during the summer and fall months.

The cost of such an installation can easily be computed from prices quoted for the necessary equipment, and the usual labor employed in a gasoline plant can make the installation. Water is not necessary with this type of exhaust, it is said, and a considerable saving may be expected because of a much longer life of the piping. In localities where water must be considered as an expensive operating item, eliminating the use of it will eventually pay for the changeover.



Method for inverting old exhaust lines in compressor engines

To Prevent Freezing of Control Instruments

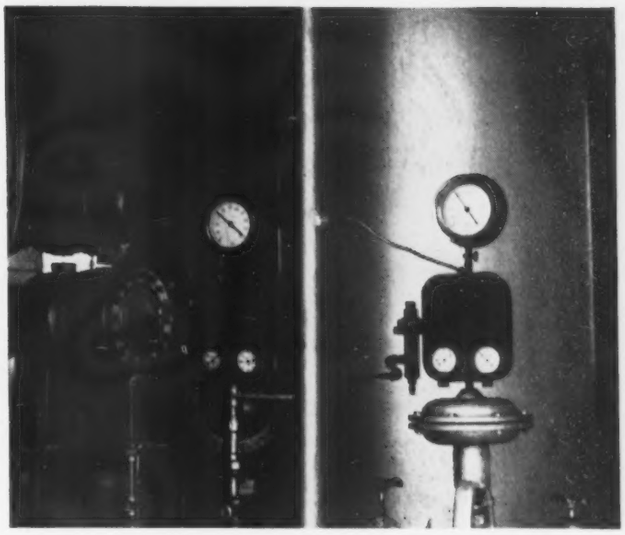
It requires only a slight amount of water vapor in compressed air to form ice in orifices of control instruments during winter, and to prevent the occurrence of this difficulty, employes in the Earlsboro gasoline plant of Barnsdall Oil Co. designed two drums to set behind the instrument board in the plant control room. One of these drums is used as a scrubber to remove condensate from the air line, and the other filled with commercial radiator alcohol. The drums were made of six-inch pipe of adequate length, equipped with connections and piping for constant flow of air through the system.

Air from the plant pressure supply flows through the scrubber and then to the base of the alcohol drum so that it constantly bubbles through the liquid. Sufficient alcohol is vaporized, or absorbed by the air to lower the freezing point of the water vapor passing to air valves on the instruments, or the water vapor is absorbed by the alcohol. Before installing this device, difficulty was encountered quite frequently, but since placing it in operation, no failures have been reported. Simple in design and automatic in operation, the equipment requires little attention, and filling is made easy by the addition of a 'boll-weevil' for the addition of alcohol when the supply in the drum becomes low.

Two drums, one as scrubber to remove water vapor from air used in instrument mechanisms, the other filled with alcohol to further prevent freezing vapors reaching the instruments, used by Barnsdall at Earlsboro

Remote Control In Gasoline Plant

Due to extremely inclement weather expected during the winter season in northern Kansas, Warren Petroleum Co. erected a building to house the controls, pumps and exchanger units of its gasoline plant near McPherson which was erected during the summer of 1936. Due to the location of some of the equipment and the size of the run-down tank, automatic valve controllers were mounted where it was not feasible to cover them with the building in which the majority of the equipment was placed. The operators of the plant, seeking to avoid interrupted service, due to ice forming on the valves, installed two of the Hanlon-Waters controls in the building, making them control the flows of liquids by remote action.



Remote control in Warren Petroleum's gasoline plant, on rundown tanks, placed inside house to avoid freezing

Both gas and liquid lines were rearranged so these controls could be moved inside the building, with the result that protection was afforded the instruments, and action of the valves in controlling the operation of the plant is said to be quite satisfactory.

W. P. A. Aids Oil Geologists By Classifying Foraminifera

WASHINGTON—Data on more than 15,000 genera and species of foraminifera, including 45,000 illustrations, are to be available for the information of geologists, engineers and other scientists as a result of work now being done by the Geological Research Project of the Works Progress Administration in New York City.

Material benefit to geologists, to the mining and petroleum industries, and to others is expected as a result of the project. "At present the petroleum industry, according to experts' reports, is losing millions of dollars every year through unscientific methods of prospecting and developing," communications from the W.P.A. state.

Workers are collecting material on foraminifera never before assembled in one place. Shells of these microscopic, single-celled animals are found in the rock layers making up the outer crust of the earth. Through identification of the tiny fossilized remains, an estimate can be made of the type of rock or soil to be encountered in drilling or excavating operations.

Although geologists have been accumulating data on foraminifera for more than two hundred years, this material has never been presented in systematized form. A vast amount of unorganized data exists in geological libraries throughout the world. It was the task of the project to collect and orientate material so that it may be presented in usable form for ready reference.

The finished product will consist of at least 25 volumes of about 1000 pages each, bound in loose-leaf form so that supplementary material may be added to keep the work up to date.

Considerable credit is given Dr. Brooks F. Ellis, geologist of note, who started the task unaided over 10 years ago. In 1930 he joined the faculty of New York University and subsequently secured the help of student assistants. Later he was aided by workers from the Emergency Work Bureau and the Civil Works Administration. Finally the enterprise was made a W.P.A. project.

Qualities of Diesel Fuels Which Control Efficiency*

By ROBERT D. BEST**

● This article discusses in an essentially non-technical manner the effect of ignition quality on the advantage of using automotive Diesels; outlines the qualities which are desirable, the limitations of the Diesel cycle, and tabulates and summarizes the test methods which have been developed for testing ignition quality. It points out that a fuel of ignition quality higher than that just high enough to avoid knock gives no greater efficiency in the given engine.

The author shows the effect of viscosity, surface tension, specific gravity, volatility and cleanliness on the value of Diesel fuels. Fig. 3 is given to show relationships between various physical-chemical methods for rating ignition quality and the cetane number by the delay method now widely used.

IN DEVELOPING the subject, it will probably be helpful to review momentarily the gas cycles.

The usual concept of the diesel cycle, Fig. 1, is shown in the lettered figure a, b, c, d, the compression, combustion, expansion, and exhaust lines being respectively ab, bc, cd, and da. Few, if any, automotive diesel engines even approximately follow this cycle. The course of events in actual engines more nearly approximates the figure, a, b, e, f, g, in which the line b-e represents a portion of the combustion which occurs substantially at constant volume, and e-f the remainder which occurs at constant pressure.

Thermally, this cycle is superior to the diesel cycle, the amount of improvement depending upon the proportion of the fuel burning at constant volume.

In actual engines, however, every effort is directed to decreasing the proportion of fuel burning at constant volume, because this part of the combustion increases the pressures that are already high, the rapid rise in pressure frequently producing roughness and knock. Combustion temperatures are also increased. These effects, if not controlled, considerably affect the wear and tear on engine parts and make necessary very heavy construction, thereby imposing severe limits to the fields in which this type of engine is striving to enter.

Much research has shown that while the rapid pressure rise may be controlled to an extent by many factors of engine design and conditions of operation, the effect itself may be ascribed to the fuel.

It is due to the fact that some time is required to ignite the fuel after its injection, even when subjected to the temperatures of the highly compressed air in the engine cylinder.

In general, measurements have shown that in any homologous series of hydrocarbons those members containing the least carbon atoms require the longest time to ignite. As between hydrocarbons of different series, the paraffins require the shortest time and the aromatics the longest. The ignition time of a mixture of hydrocarbons is near that of the component igniting in the shortest time.

The relation between the ignition time and the ignition temperature has been shown by Bridgeman and Marvin (1) from whose paper Fig. 2 has been taken. In these experiments fuel was injected into a controlled temperature bomb containing air under pressure. It is shown that there is always a time interval between injection and ignition which varies over a wide range, depending upon the temperature.

When the injection valve of an engine opens and fuel starts to spray into the cylinder, ignition does not immediately take place, this same delay occurs. During this time more or less fuel, depending upon its characteristics, accumulates. When ignition occurs, this accumulated fuel is quickly consumed in about the same manner as combustion in the familiar gasoline engine, resulting in the rapid pressure rise and fuel knock.

The effect of temperature on the ignition delay has been shown in engines by Boerlage and Broeze (2). These pioneer investigators showed also the effects of many operating variables; briefly, they may be summarized as follows:

Fuel temperature: No effect unless the temperature is low enough to prevent proper distribution of the fuel due to high viscosity, in which case the delay increases.

Air temperature: Increasing air temperature shortens the delay.

Load: Increasing load shortens delay.

Air pressure: Throttling the air increases the delay while supercharging shortens it.

They also introduced the method of rating fuels by comparing them with mixtures of high and low reference fuels. This method, which has been since followed by most investigators, uses as primary reference fuels cetene, which is a readily ignitable fuel, and alpha methyl naphthalene, which is very difficult to ignite. A rating is secured by measuring some effect of the fuel, for example, time delay, and then determining the proportions of a mixture of cetene and alpha methyl naphthalene which will

*Presented before the meeting of the Society of Automotive Engineers, Tulsa, Okla., Sept. 30-Oct. 1, under the title, "Essentials of Fuel Utilization in Diesel Engines of the Automotive Type."

**Continental Oil Co.

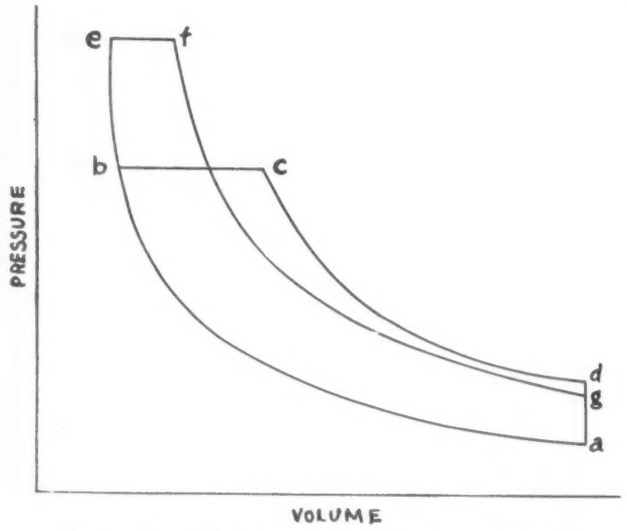


Fig. 1. Theoretical and practical concepts of the Diesel cycle

have an equal effect. The result is expressed as a cetene number, the number being the per cent of cetene in the mixture. More recently, cetene has been replaced by cetane, a fuel of nearly equal ignition qualities and better stability but which is more easily produced in a sufficiently pure state.

Now, obviously, there are several effects of the fuel which might be used to determine the knock rating. As pointed out by Schweitzer and Hetzel (3). The three operating variables, compression ratio, injection advance angle, and ignition time, are all inter-related so that by keeping any two constant and measuring the third, yields three possible means of fuel rating. In addition, since air pressure and temperature both have an effect on the delay, these variables could be used. Then there is the method of determining the minimum compression ratio at which a fuel will ignite and a method relating directly to the effect of a knock on the engine and computed from the rate of pressure rise. In addition, there is one method based upon the fact that the desirable ignition qualities of C. I. fuel and carburetor engine fuels are diagrammatically opposite. In this method C. I. fuel is blended with high octane reference fuel and the octane number of the blend determined in the regular manner.

Nearly all of the above methods have been used by various investigators and surprisingly in most cases the methods give almost identical results.

Many attempts have been made to relate knock to physical and chemical properties of the fuel.

These methods classify the fuels in accordance with their paraffinic or naphthenic properties. These relations found have also been quite successful.

A summary of the more important methods is given in table I.

Boerlage and Broeze (2) originally pointed out that the knock rating of a blended fuel could be predicted from the knock ratings of the separate portions, a straight line relationship holding. This has been substantiated by the work of Hubner and Murphy (4) except for special fuels containing dopes. In fact, for doped fuels, no method except engine performance seems to have much value. This has also been indicated by the work of Good (5).

As to the normal fuels (those derived entirely from petroleum), the methods depending upon physical and chemical properties can usually be relied upon to predict engine performance within a few cetane numbers.

From the data of Hubner and Murphy (4) I have prepared Fig. 3 showing the general relationship between the results obtained by various physical chemical methods and the cetane number by the delay method.

TABLE I

Methods for Knock Rating of Compression Ignition Fuel Engine Methods

Name of Method	Variable	Formula	Pioneered by	Reference
Ignition delay	Ignition delay	...	Boerlage & Broeze	(2)
Critical Compression Ratio	Compression Ratio	...	Pope & Murdock	(6)
Required Compression Ratio	Compression Ratio	...	Schweitzer & Hetzel	(3)
Combustion Knock	.....	(a)	Joachim	(7)
Blending Octane Number	.....	(b)	Hubner & Murphy ...	(4)
Methods Depending Upon the Measurement of Chemical and Physical Properties of the Fuel				
Diesel Index No. Viscosity Gravity No.	.....	(c)	Becker & Fischer ...	(8)
		(d)	Hill and Coates .... and modified by Moore & Kaye	(9) (10)
Boiling Point Gravity No.	.....	(e)	Jackson	(11)
Universal Oil Products Characterization Factor	.....	(f)	Watson & Nelson	(12)

(a) Explosion pressure rise, measured in pounds per square inch, is the rapid increase in pressure following injection.

Burning rate is the E. P. R. divided by the crank angle in degrees during which the E. P. R. occurs.

$$\text{Combustion Knock} = \frac{\text{E. P. R. x B. R.}}{104}$$

(b) In the method of the reference authors, blends containing 25 per cent C. I. fuel and 75 per cent high octane reference fuels were used. The octane number of the

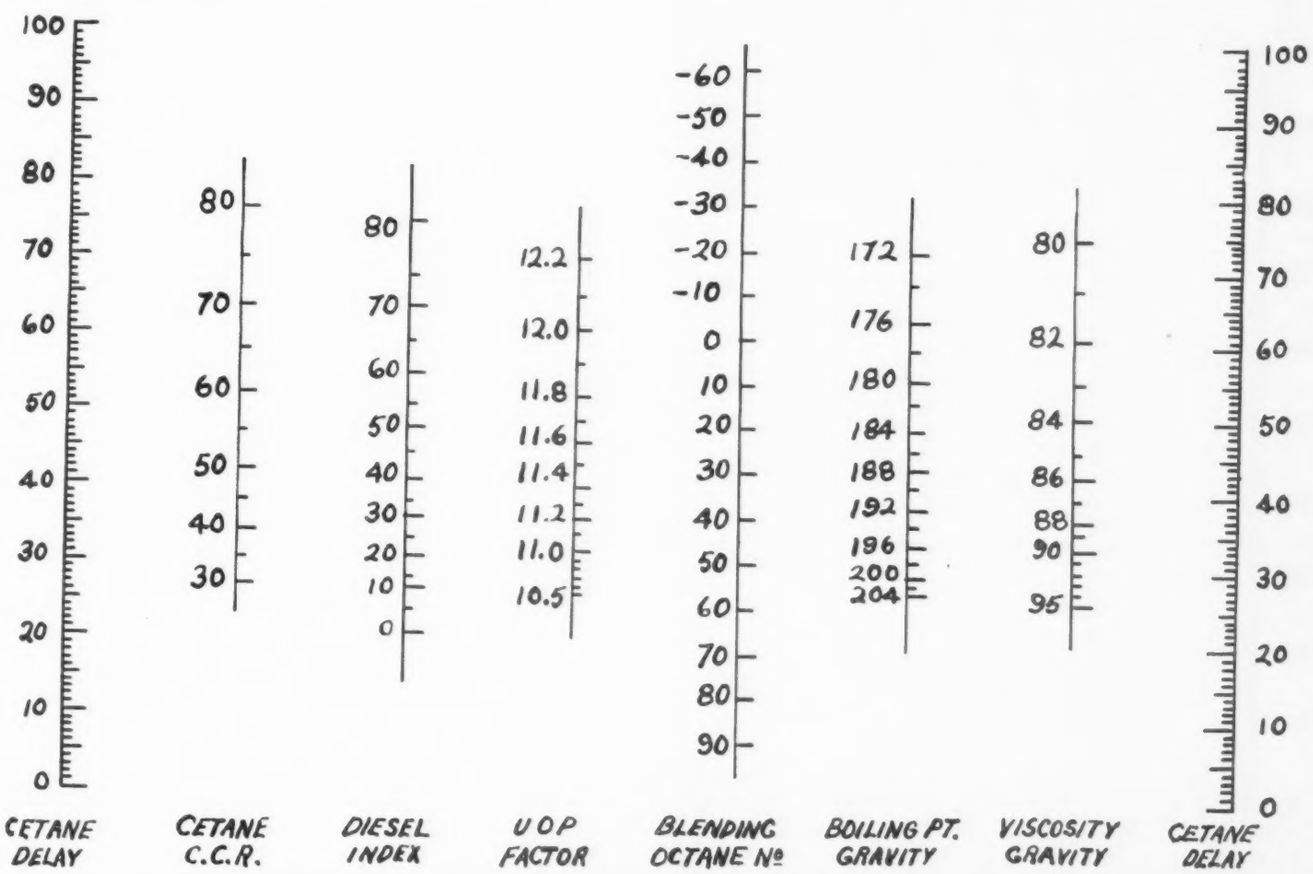
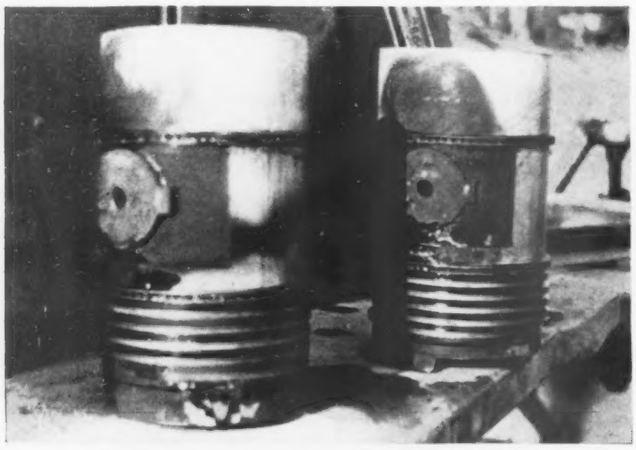


Fig. 3. Chart showing relationship between the various physical-chemical methods of determining ignition quality, and the cetane number determined by the delay method

Pistons from a Caterpillar Diesel D-11000 Tractor after 4,200 hours operation on an SAE 30 Alox-blended Pennsylvania oil.



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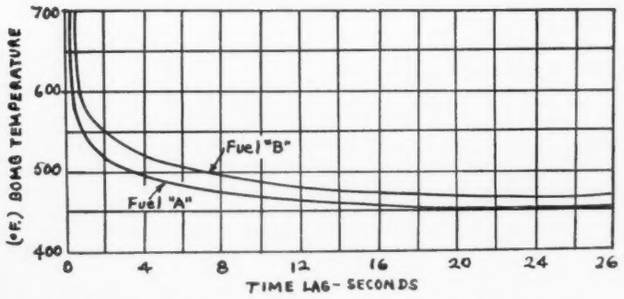

Fig. 2. Relationship between ignition time and ignition temperature (From Bridgeman and Marvin)

blend was determined by A. S. T. M.-C. F. R. motor method. The blending octane number is obtained by solving the following equation for X in which X is the blending octane number and Y is the octane number of the reference fuel.

$$.25\ (x) + .75\ (Y) = \text{Octane Number of Blend}$$

(c) Diesel Index = *Aniline Point (Deg. F.)* × *A. P. I. Gravity* ÷ 100

(d) The viscosity gravity constant of Moore and Kaye is obtained by solving the following equation for A:

$G = 1.082\ A - .0887 + (0.776 - 0.72A)$ (log Log (KV-4) in which G = specific gravity at 60° F.

A = viscosity gravity constant

KV = Kinematic viscosity in millistokes at 100°F.

(e) The boiling point gravity constant is obtained by solving the following equation for A.

$G = A + (68 + 0.703A)$ log B. P. in which

A = boiling point gravity constant

G = API gravity at 60° F.

BP = 50% distillation point in deg. C. (f) U.O.P. characterization factor $= \dfrac{(T_b)^{1.3}}{S}$

S = specific gravity at 60° F.

T_b = Molal average boiling point in deg. Rankine

Note: The original article should be consulted as to the method of determining the Molal average boiling point.

In leaving this phase of the problem it should be noted that while a sufficiently good fuel is necessary to eliminate roughness and knock, the use of a still better fuel does not improve efficiency or give greater power. Nor can engines be built for utilization of high cetane fuels in which advantages will attach due to superior efficiency.

On the other hand high mean effective pressures are very necessary for this type of engine to enable it to compete successfully with carburetor engines. To secure this means just one thing, the complete combustion of all the oxygen taken into the cylinders. Unlike gasoline engines, these engines cannot be operated continuously over rich as the exhaust becomes smoky and offensive. Furthermore, this condition results in excessive deposits of gum and carbon inside the engine.

Many and varied are the design details used to bring the fuel into intimate contact with all of the oxygen. Some of these may be listed as follows:

1. Nozzles designed to give sprays of certain geometrical forms found by experiment to be superior.
2. Combustion chambers made to fit the spray or designed to give a certain degree of turbulence to the charge.
3. Hot plates or hot walls designed to vaporize impinging fuel.

It is evident that certain fuel factors are also of importance in bringing about this desirable state of affairs. These factors are listed as follows:

1. Viscosity
2. Surface tension
3. Specific gravity
4. Volatility
5. Cleanliness

Since relatively little work has been done in the exam-

ination of these factors, only general statements can be made at this time.

The first three decide the relative penetration, dispersion, and atomization of fuel sprays.

Viscosity affects fuel pump leakage and lubrication, and for this reason a certain minimum value is usually specified. It also may, if high enough, influence the coefficient of discharge through the pump nozzle and so reduce the velocity of emergence. This latter effect, however, is usually unimportant for the fuels marketed at present. Major interest is given to viscosity because of its effect on the fineness of atomization.

Under conditions obtaining in an engine, when the nozzle valve opens, an extremely high speed stream of oil issues forth which is immediately broken into a conical shaped cloud of oil droplets. The outer layer of the stream is pulled off near the nozzle, and as the stream progresses across the combustion chamber succeeding layers are removed until the whole jet is atomized. This peeling process is due to the surface forces exerted by the highly compressed air surrounding the jet. As these droplets are formed, they do not lose all of their velocity but continue of their own momentum across the combustion chamber. As the jet continues along its path, the number of the droplets is increasing; and due to the corresponding increase in surface, a larger and larger quantity of air is moved along with it. Since the fineness of the atomizing process depends upon the relative motion of the air and the oil, these particles in the outer portions of the cloud, which were formed nearest the nozzle, are much smaller than those on the inside which were formed later and after the surrounding air had acquired considerable velocity. The spray thus formed contains particles which vary greatly in size.

Experiments have shown (13) (14) that when the injection pressure is increased the mean diameter of the drops becomes smaller (due to the increased velocity in the jet); and the angle of the cone increases, thus moving more air, but the penetration of the spray remains substantially constant. Kuehn (15) has shown in a limited number of experiments with injection into air at atmospheric pressure that at low injection pressures the mean diameter of the drops decreases about in proportion to viscosity; at higher pressures the effect of viscosity diminishes and the effect of surface tension assumes more importance.

Lee and Spencer (16) have confirmed this in considerable measure. With relatively low injection pressures into air at atmospheric pressure, with different liquids, they found considerable difference between the liquids, the degree of disintegration depending upon viscosity. The difference seems to be more pronounced the higher the viscosity. One exception however occurred with water. This was the only liquid tested which differed materially from the others in surface tension, being a little more than twice any of the others. Atomization was relatively poor. Two diesel fuels were also tested at high injection pressures and high air densities. The absolute viscosity differed by about 5 fold. In this case very little difference was found in the degree of atomization. In fact the difference was so slight that it is hardly conceivable that it would have any measurable effect in the operation of an engine. Since most manufacturers find it necessary to impose an upper limit on the permissible viscosity of the fuel, it is apparent that here is a situation that needs further clarification. Further work may indicate that either, as the viscosity increases, greater differences will be found or that the upper limit found necessary by the manufacturers is not really a viscosity limit but is in reality a volatility limit.

The latter possibility is perhaps supported somewhat by the work of Rothrock and Waldron (17) whose main conclusions were "First, there is considerable vaporization of the injection fuel in a high-speed compression ignition engine during the time available for injection and combustion. Second, this vaporization affects the course of combustion."

The principle effects of specific gravity are on the penetration of the fuel charge and the resulting spray cone angle. The heavier oils penetrate deeper into the combustion space but have a narrower cone angle resulting in a net decrease in distribution. This is shown by

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Joachim (18) whose data, while probably correct, were based on the use of various fuels which varied widely in viscosity as well as specific gravity.

It sometimes seems desirable to operate with substandard fuels or in unusual conditions; and for this reason to insure continuous and satisfactory operation of their engines, most manufacturers have found it necessary to be insistent upon the use of clean fuel, having in mind the lack of both suspended solids and corrosive substances in solution. Troubles in this connection have largely been confined to fuel pumps and injectors. When it is realized that clearances of these parts may be measured in a few hundred thousandths of an inch (19) it will be apparent that lapping and scoring may be caused by the presence of even extremely fine particles.

Our experience indicates that this factor is of major importance. It is of course the responsibility of the refiner to deliver to the customer a clean fuel; however, it is by no means unusual to find that fuel becomes badly contaminated in storage and in service. It is up to the operator to keep this contamination down to a minimum. In spite of what both the operator and the refiner may do, it is still necessary that the engine filters be capable of doing a good job. This not only requires good filters in the first place, but also means proper maintenance by operator.

Many operators buy fuel on a price basis only and penalize their operations and costs accordingly.

The twin problems of erosion and corrosion are discussed by Behn (20). These low-grade fuels have frequently been the source of carbonization on nozzle tips and the carbon residue test has frequently been applied as a measure of this tendency. Operation in cold climates usually requires consideration of the pour point of the fuel which should be a few degrees lower than the lowest temperature of operation.

In conclusion, it should be noted that while the fuel factors have herein been discussed as more or less unrelated variables, that on the contrary they are very intimately associated with each other and with the conditions of operation.

For example an increase in the volatility of a fuel might increase its roughness because, when ignition occurred, there would be more fuel in the cylinder prepared for combustion. There is probably a disadvantage in shortening the delay period more than necessary, as this results in a less efficient cycle. Much speculation on this point has already occurred and at least one manufacturer specifies in addition to a minimum a maximum value for ignition quality. In a recent paper, Wilson and Rose (21) have shown that when an engine has a sufficiently high compression ratio, that either high or low cetane fuels may burn smoothly or roughly, depending upon simple adjustments of the injection advance angle. Or in other words with optimum advance angles for each type of fuel, equal smoothness is secured.

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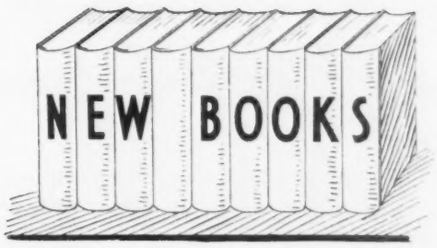


How to Make Alignment Charts

By M. G. VAN VOORHIS

The engineering and operating professions during recent years have gone in for the use of nomograms and charts for simplifying mathematical calculations, especially those which may be repeated a great number of times over a long period. Calculations in plant design, volumes of containers, areas and surfaces, and many other types of problems may be solved in a timesaving manner by the application of nomograms to the graphical solution and use of mathematical equations.

This new volume just off the press is written by an instructor in nomography, now on the technical staff of NATIONAL PETROLEUM NEWS, who found when instructing engineering students in this subject that available books were not suitable as aids in this type of instruction. Himself in close touch with many of the engineer's problems in this field, he has reduced to a relatively simple basis the principles involved in transferring mathematical equations and formulae to nomographic form, covering practically every type of problem which the practical engineer may meet in nearly any engineering field. Sufficient discussion of the theory of nomography and chart-making is included to clarify the subject for those who wish to delve further into it; the work is, however, essentially a practical work, bridging in clear fashion the gap between theory and the practice of developing and using nomograms in engineering's daily problems.

The work takes up in turn some 20 different types of equations and formulae, and from them develops typical and illustrative charts. Among these equations may be mentioned, merely as illustrations of the method of treatment; multiplication or division of two variables raised to constant or variable powers; sum or product of functions of variables in equations of more than three variables; the Z chart for equations of four functions with parallel or perpendicular solution lines, etc.

Though highly mathematical in the reading, these problems are worked out in practical applications, such as a formula for computing the flow of steam, from an equation which offers serious obstacles when used purely in mathematical form. Another is for the use of hygrometric data such as taken from Smithsonian tables; chart for helical spring design; a chart for Lame's formula, for determining the stresses in thick-walled cylinders, such as pressure vessels, reaction chambers, absorption towers, etc. Of special interest is the method of applying nomograms to the relationship between volume and temperature of gases at constant pressure, a field where the application is useful to gas engineers, chemists and natural gasoline operators. Other widely useful applications of the principles covered are for instance volumes of cylindrical tanks with spheroidal ends.

The foregoing examples of the phases of the field covered in this work are only illustrative and only a small number have been mentioned. The volume, of 114 pages and containing 78 illustrative charts, is obtainable from the Book Department, NATIONAL PETROLEUM NEWS, price $2.50.

Petroleum Technology

Petroleum Development and Technology, 1937, just published by the American Institute of Mining and Metallurgical Engineers, is the twelfth of this series containing the transactions of the Petroleum Division. It contains the papers presented before the division at Los Angeles and Fort Worth last October and at New York last February.

There are seven chapters devoted respectively to production engineering, production engineering research, industry stabilization, economics, production, petroleum engineering education, and refining. Half of the book's 700 pages are taken by material on production. The subject is divided by states and countries. Refining is confined to a 4-page general account of developments in 1936 by Walter Miller. Industry stabilization and economics include several interesting subjects which fill a third of the book.

Some of the subjects covered in these chapters are: the rule of capture by Earl Oliver, governmental regulation of production by Northcutt Ely, and economics and Well Spacing in Texas by W. E. Hubbard. A discussion of supply, demand and stocks by Fred Van Covern is included, chronological aspect of oil-reserve replenishment by H. J. Wasson, role of price in proration by Joseph E. Pogue, developments in petroleum marketing by Sidney A. Swensrud, and world consumption by V. R. Garfias and R. V. Whetsel.

This year's edition is the largest volume of the series since 1928 and contains 150 pages more than last year. Prices of the book, also designated at Transactions Vol. 123, is $5. It may be obtained at the institute headquarters, 29 West 39th St., New York.

* * *

U. O. P. Laboratory Tests

Testing methods for various fractions of petroleum, ranging from gaseous hydrocarbons to coke, are contained in "U. O. P. Laboratory Test Methods for Petroleum and Its Products," which is just off the press.

These test methods, numbering about 100, have been compiled and edited by Charles Wirth III and Frank J. Vitovec, Jr., with the assistance of their associates in the analytical and control laboratories and the counsel of members of the Universal Oil Products Co. research and development laboratories at Riverside, Ill. Many of them have been used for a number of years and all have been tested and proved in the Universal laboratories.

The book contains 250 pages, is substantially bound in board covers, which permits it to lie flat when opened. It is illustrated by a number of drawings of the apparatus described and graphs for the interpretation of the tests. The price of the book is $3.00.

* * *

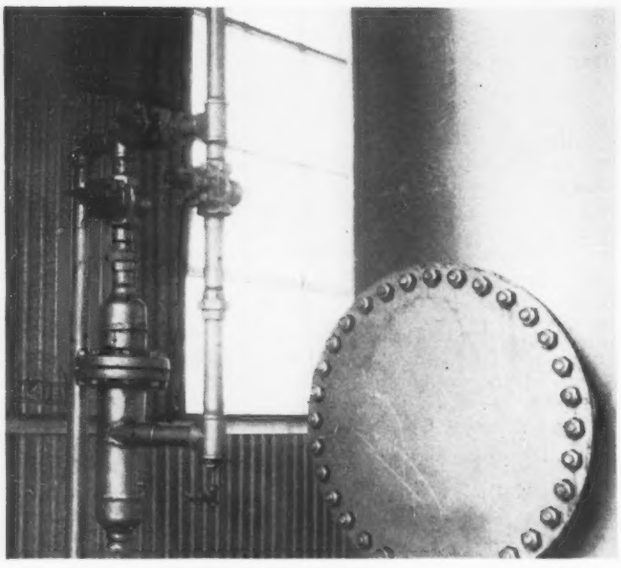
Treatise on Production

"Petroleum Production," by Wilbur F. Cloud, has recently been published by the University of Oklahoma Press, Norman, Okla. Mr. Cloud is associate professor of petroleum engineering in the Oklahoma school.

The author ambitiously set out to present authoritative discussion of the producing industry, all the way from the legal aspects through sub-surface conditions, drilling, producing methods and down to the storage of the oil. In this he has succeeded in turning out a book that is up-to-date, recognizes the numerous changes that have been made in methods and for the greater part has made his book understandable to the man who lacks technical training. Mr. Cloud, however, has not sacrificed essential technical data, hence the book contains numerous tables and formulae with which petroleum engineers regularly work.

Separator For Gasoline Treater

When treating natural gasoline, small quantities of solution may be pulled over with the gasoline leaving the top of the contacting towers, which must be separated from the liquid before it is shipped in truck tanks or tank cars. In order to prevent this material from entering vessels other than the treating column, Warren Petroleum Co. employes installed a tangential separator on the gasoline line leading from the contact column in its Galva, Kansas, gasoline plant. Two by four-inch swedges



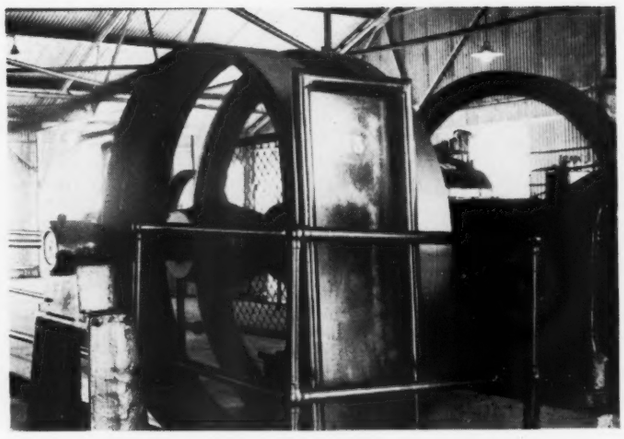
were utilized, together with short nipples of pipe so the size and capacity could be obtained that would be sufficient for their needs in this case. One section was longer than the other, and both were joined by using a bolted flange.

The inlet was welded in the lower section, so centrifugal force would affect separation, and the gasoline leaves the device through the top outlet. When cleaning, if the material should not drain through the small pipe attached to the bottom of the unit, a by-pass can be used while the separator is taken apart and cleaned.

Compressor Belt Guards

Realizing that wide and rapidly moving heavy belts used to drive compressors can give a person a heavy 'wallop', operators in Skelly Oil Company's "Carter Nine" gasoline plant, in Osage County, Oklahoma, developed a steel guard so that if and when a belt breaks while in service, the guard will take the brunt of the impact, rather than a man who might be in the immediate vicinity at the time.

The guards were made of heavy steel, of the same type as that employed in tank roofs, attached to two-inch frames firmly set in holes drilled in the concrete floor, between the guard rails and the belt pulley on the gas engine. The plates extend from the floor level to a height sufficient that no matter how much of the belt piles up against it, no harm may be done to an employe, or other person, even if he were standing directly behind one. The installation of this type of guard, and other safety features indicate that employers in the oil fields are considering more seriously the life and limbs of their employes.

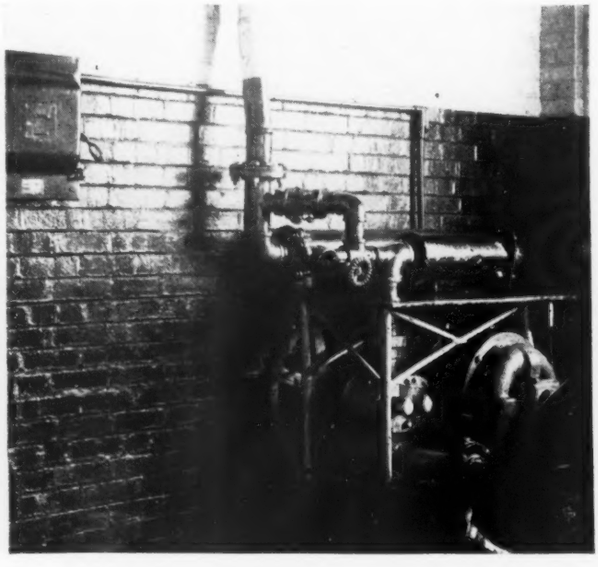


Belts guards installed in Skelly's "Carter Nine" gasoline plant compressor station, Old Burbank Field, Okla.

Lubricating Grease Strainer

Operating one of the largest steam-jacketed grease manufacturing kettles ever installed in the mid-continent, Skelly Oil Co. installed auxiliary strainers on the outlet of the vessel, to insure material free from foreign matter. The original outlet from the kettle was connected to a motor-driven gear pump which forces the lubricant through the lines to the packaging machinery.

The discharge from the pump passes through two strainers, placed in such a position that they may be used in series, or one cut out of service if needed. The strainers were made in the plant shop by utilizing short nipples of pipe, with flanges on one end of each to facilitate dismantling and cleaning the screens. The entire unit, including the motor, pump and screens was mounted in a steel frame which fits snugly in a corner of the room out of the way of other equipment, but in a position that servicing may be easily accomplished.



Strainer placed on discharge end of Skelly's kettle evacuating pump, to prevent foreign matter passing into containers with the lubricant

Activities OF EQUIPMENT MANUFACTURERS

Hammer Lug

Another addition to Crane Co. products is a new line of hammer lug unions. Two types are offered, one consists of forged steel screwed unions with one set of lugs and the other has two sets of lugs. Both are designed for use in piping systems requiring frequent or quick dismantling either to save time on the job or for emergency purposes. In either case a blow with a hammer upon the lug will immediately break the joint, it is said, without using a wrench.

One application in the oil industry is in field work around the boiler to permit dismantling in a hurry when a complete unit has to be moved to a new location. Seven sizes from ⅜ to 4 inches are offered.

* * *

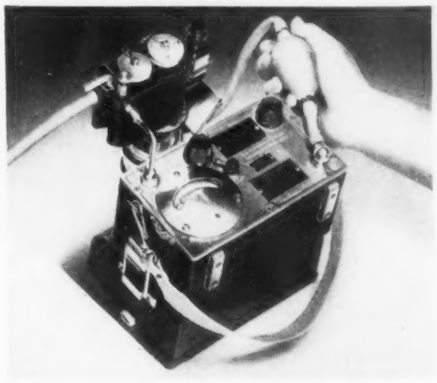
New Distributor

The Babcock & Wilcox Tube Co., Beaver Falls, Pa., has appointed Uhrich Supply Co., Kansas City, Mo., as distributors of boiler tubes in western Missouri and Kansas.

* * *

Gas Indicators

A new line of UCC gas indicators for detecting explosive or irrespirable gas-air mixtures is announced by The Linde Air Products Co., New York. Uses include tests of oil storage tanks and in oil tankers as well as any suspected



points about refineries. Indicators are available in three models fitting various conditions of use. One model combines three units in one. It shows the presence of combustible gases, indicates oxygen deficiency, and determines the presence of carbon monoxide and hydrogen sulfide.

* * *

Tubes

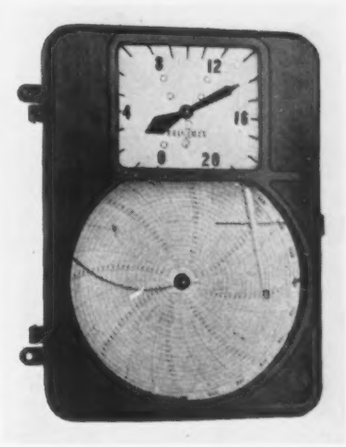
Steel & Tubes, Inc., subsidiary of Republic Steel Corp., Cleveland, has opened a branch office in Baltimore. The entire line of products will be handled. H. H. Smith is in charge.

* * *

Instruments

Describing its entire line of Synchro diaphragm control valves, Bulletin 461 has been completed recently by The Bristol Co., Waterbury, Conn. The new potentiometer pyrometer, shown in the illustration, has been a recent development of the company for recording and indicating thermocouple temperatures.

The Pyromaster is said to operate on a new and simplified principle. One of the features is that there is no mechanical motion except when a change in temperature occurs. The pen arm or indicator is actuated through the relay switches in small steps at a rate depending upon the rate of change in temperature at the thermocouple. No lubrication is required. Bulletin No. 489 contains the details of the instrument.



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Control Instruments

Four distinct methods of temperature measurement and control are presented for the first time by Leeds & Northrup Co., Philadelphia, in a newly published broadside, N-33. All employ null-balance principles. Familiar to plant men are three of these — thermocouple pyrometers, resistance thermometers and optical pyrometers. New to many are Rayotube pyrometers applicable to a temperature range of 300° to 5000° F. under certain conditions. The complete line of Micromax and other pyrometer instruments is illustrated and briefly described.

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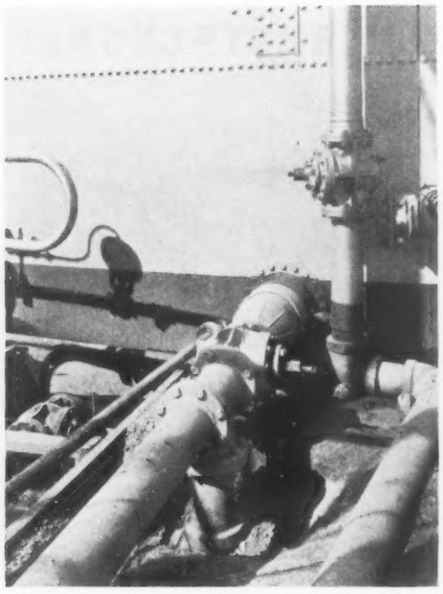

Nordstrom valves on suction discharge, water draw-off and vapor recovery connections of 80,000 barrel gasoline storage tank at Associated Oil Company, Avon Refinery, Avon, California.

4" high-pressure Nordstrom valves on light oil circulating line in a California refinery.

THEY SAY:

"There's nothing like a Nordstrom when you want to keep the lines tight."

...and Nordstroms are the only valves that meet every major valve need.

Size—half inch to 30 inches—working pressure to 5000 pounds w.p. — Available for handling temperatures from —60° to +600° F.

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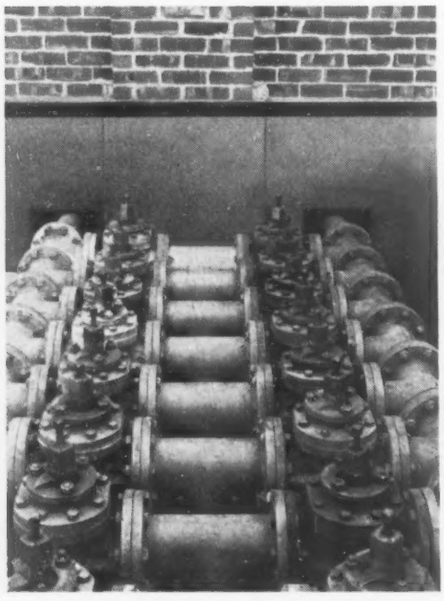
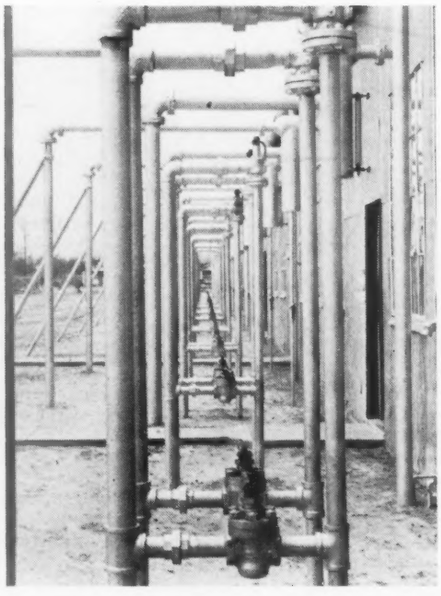


4" Nordstrom valves on light oil circulating piping at Avon Refinery of Associated Oil Company, Avon, California.



Nordstrom high-pressure valves on compressor lines from compressors to distillation in an Oklahoma gasoline plant.

NORDSTROM *Lubricated* VALVES

MEETING EVERY MAJOR VALVE NEED • *WITH PATENTED "SEALDPORT" LUBRICATION*

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Improved Diesel Engines Studied By Oil and Auto Engineers

TULSA, Oct. 2

THE development of the diesel engine and its application to oil country transportation and mechanical problems, diesel fuels and the proper determination of their essential characteristics, the fitting of gasoline and crankcase lubricants to seasonal conditions and demands and several other major fields of mutual interest to automotive and refining technologists alike were discussed exhaustively here this week before the southwest regional meeting of the Society of Automotive Engineers. Meeting Sept. 30 and Oct. 1 the Society members in the Mid-Continent region aided by nationally known automotive leaders, held six sessions, in two days in which, problems, difficulties, successes and failures were aired on an exchange of information of primary interest to the 150 men attending the meet.

The rapidly increasing importance of the diesel engine as prime mover for the oil industry and in the oil country was recognized by the presentation of three papers dealing with the compression-ignition engine.

The present efficient automotive and stationary diesels have evolved through a long and painful process from the original slow-speed, powdered coal burning engine invented more than a generation ago, C. L. Cummins, head of Cummins Engine Co., showed while tracing the development of the diesel cycle. Outlining the difficulties which were faced and solved when changing the engine from a solid to a liquid fuel burning type Cummins, himself one of the best known American pioneers in diesel development, presented many pictures and slides to show the step-by-step methods of solving seemingly insurmountable difficulties.

To the automotive and refining industries the automotive diesel is of the most absorbing interest. Its fuel and its lubricants offer the most difficult technical problems, and to this type diesel the greater attention was paid at this meeting. Problems of weight-power ratio have been worked out, Cummins stated, until relatively little difference exist now between diesel and gasoline engines suitable for a given purpose. Fuel efficiencies as low as 0.42 lbs. per horsepower-hour are easily attained now, he said, in automotive engines, and this performance can be readily duplicated.

Solid injection of fuel has replaced air-injection methods, speakers pointed out. Air injection has the decided advantage of greater and more uniform atomization of fuel, especially heavy or high viscosity fuels, but loses this advantage to solid injection because of the greater exactness of metering the fuel charge by

By ARCH L. FOSTER
N. P. N. Technical Editor

• • •

the latter, a factor of primary importance in automotive engines with their demands for widely varying speeds and loads. Much discussion of the adaptation of diesels to bus and truck operations was indulged in and the widespread interest shown was enhanced by the national and international character of the speakers present.

Asked to explain how the London Omnibus Co., operating 2500 diesel-powered buses, has eliminated exhaust smoke and odor in daily operations, R. Stansfield, head of the Sunbury Research laboratory of Anglo-Iranian Oil Co., stated that the solution of this problem was obtained in two ways; first the slow and careful evolution of the diesel and its accessory equipment to obtain uniform and complete fuel combustion; and second, the careful and thorough training of bus drivers, especially in operating the throttle in the very exacting start-and-stop operation of buses in a large city.

London municipal regulations are extremely strict and inflexible, it is reported; a bus giving a smoky or odorous exhaust will be stopped by the first patrolman and held inactive until the malfunctioning is corrected. It is therefore imperative that engines operate without this trouble continuously and always. This bus company is converting its fleet, the largest in the world, entirely to diesel power as fast as gasoline engines are scrapped, and its operations are a model for similar uses of the diesel the world over.

In actual, practical fuel economy of the diesel engine in general service, this engine will do a given job with, say, four gallons of fuel where the gasoline engine will require six gallons for the same job, said A. F. Campbell of Waukesha Motor Co., another pioneer company in the diesel power field. The Hesselman engine will do the same job with 4½ to 15 gallons of the same fuel used by the diesel, he stated in comparing the three types. "If . . . operators wish to show specific profits on diesel operation," Campbell stated, "they must at the outset recognize along with its many advantages its limitations, and must learn to live with the diesel engine the same as they learned to live with the gasoline engines in the early days of their operation."

By reason of a change in ring design, Waukesha engineers believe the nasty problem of ring sticking, which has re-

SAE technologists discuss diesel engines. Left to right: R. D. Best, Continental Oil Co.; H. D. Hill, Hill Diesel Engine Co.; C. L. Cummins, Cummins Engine Co.; J. C. Brazier, Barnsdall Refineries, Inc.

Nationally known technologists meeting with the regional group of the Fuels and Lubricants Activity Society of Automotive Engineers in Tulsa. Left to right: A. W. Herrington, Marmon-Herrington Co.; O. C. Bridgeman, U. S. Bureau of Standards; U. B. Bray, Union Oil Co. of California; D. G. Proudfoot, Phillips Petroleum Co.; R. Stansfield, Sunbury Laboratories of Anglo-Iranian Oil Co., London, Eng.; B. E. Sibley, Continental Oil Co., and general chairman of the Tulsa meeting

tarded the development and output of their Comet type diesel, has been solved for that engine, Campbell stated. With this design change this engine has been operating as long as 2000 hours without rings becoming stuck, whereas before they stuck in approximately 300 hours with the older type rings.

The Hesselman engine, German development and built in this country by Waukesha is a hybrid, using solid injection of heavy fuels of the diesel type, but depending upon a spark plug to ignite the fuel, instead of the heat of the highly compressed combustion air in the cylinder as does the diesel. Low compressions are used, of the order of those of the gasoline engine, in contrast to the 14:1 to 17:1 compression ratios of the diesel. This appears to make for smoother operation, engineers state, but at a corresponding loss of fuel efficiency. The Hesselman will use 0.52 lbs. per horsepower-hour, Campbell said, at three-quarters load, which agrees well with diesel efficiency in the field, he indicated.

As for certainty of uninterrupted operation, again referring to London figures, a record of 200,000 bus miles per stop requiring calling the service wagon has been made by the Omnibus Co., Campbell reported. A more careful system of check-up and maintenance is required for diesels than for gasoline engines. Fuel must be kept very clean of foreign solid matter because of the exacting clearances of fuel pumps, and matter of secondary importance in using gasoline.

Oil filters must be changed and serviced more regularly, and failure to change or clean filters, and to change oil at the proper time is more certain in the diesel to result in ring sticking and bearing difficulties. Altogether the diesel costs 10% to 15% more for maintenance than does the gasoline engine, a small factor when considering the much greater overall efficiency of diesel engines, he said.

Maintenance and inspection that was good enough to show dividends on the gasoline engines was found to be not good enough for diesels. Although operation may continue to be satisfactory for a time after damaging conditions have been set up, the effect of neglect was found to be much more severe with diesels than with gasoline engines.

Competent operation calls for a close watch of the exhaust which he called the "pilot light of diesel operation" and operation at all times in a gear that will permit instant acceleration when the throttle is opened. Taxing a gasoline engine beyond its capacity results in stalling but a diesel apparently will hold on indefinitely at the expense of smoky exhaust, stuck piston rings, damaged bearings and scored cylinders.

Along with both types of Waukesha engines goes a small oil testing outfit, Campbell mentioned. Though not a careful laboratory test, this unit enables the operator in the field to make a quick check on residue, hard lacquer and gum in the oil, avoiding the danger of using oil too long and inducing the attendant troubles which soon follow.

F. M. Young, Young Radiator Co., who discussed engine cooling problems before the Tulsa SAE meeting

In discussing different problems brought to mind by the formal papers given, the matter of solvents for removing or preventing deposition of gum Dr. U. B. Bray, Union Oil Co. of California, brought out the pertinent fact that no solvent possessing the required properties for gum removal or prevention is a suitable material to have in contact with bearings, rings, etc., in the engine. Other speakers pointed out that such materials should be introduced into the engine separately and not incorporated in either fuel or lubricant, a conclusion which appeared to be the sense of the meeting, or of those discussing this particular problem.

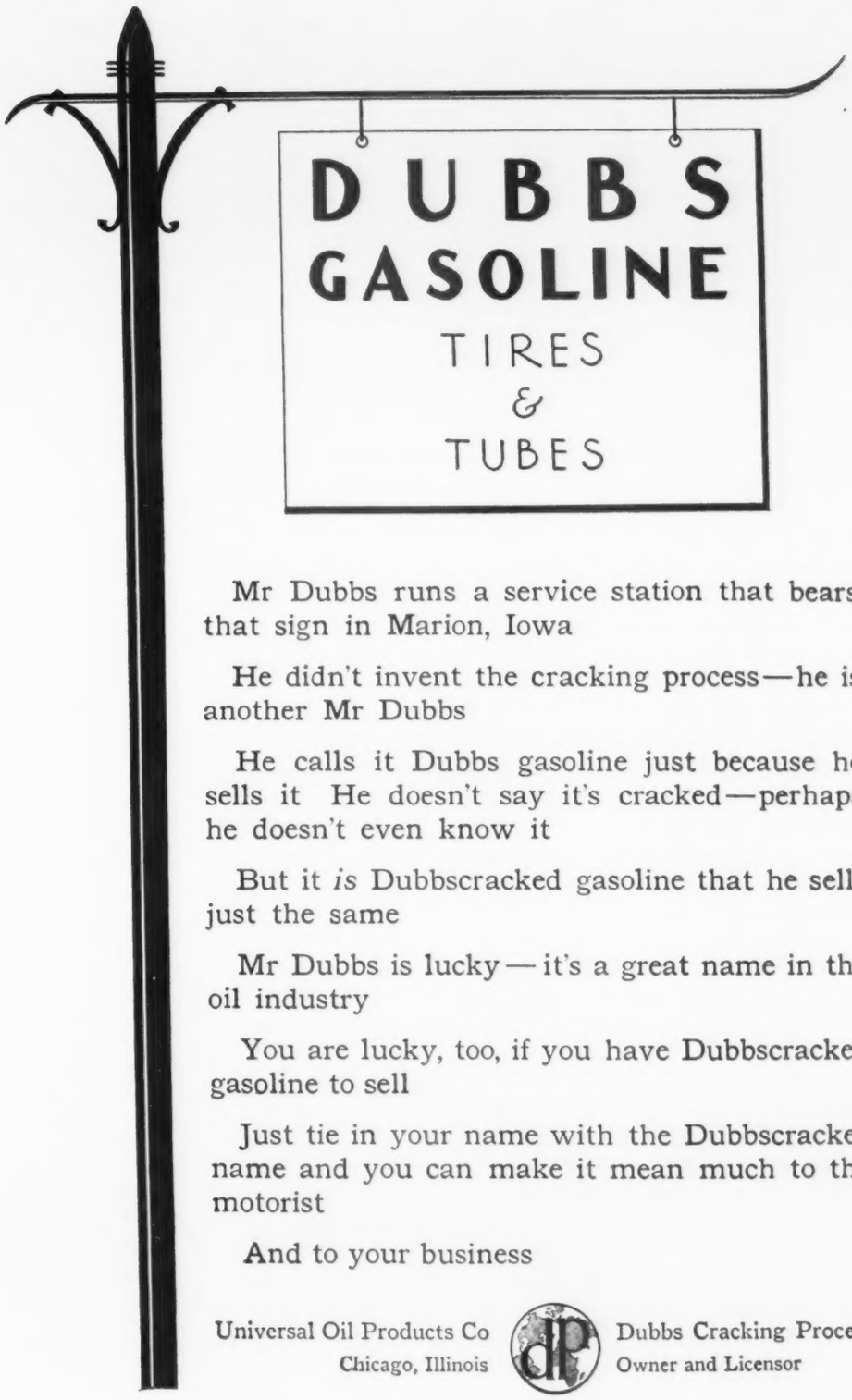
Takes to the Swamps

The adaptation of the automotive engine to the truck and tractor for extremely severe services was exemplified in a striking manner by A. W. Herrington of Marmon-Herrington Co., which showed the Swamp-Buggy, a tractor-type prime mover with huge ribbed rubber tires which takes to road, swamp or shallow water with equal facility and efficiency. Adapted for this type of service, it is being used by geophysical and prospecting organizations on the Gulf Coast and other areas where the conventional type of equipment is literally unusable. This equipment gets a fuel efficiency of three to four miles per gallon in the swamp, and five to six miles on the highway. It carries 4000-5600 pounds load per tire, and in Iraq has transported 64 tons on 32 tires with ease and safety, Herrington stated.

Actually two cooling systems will be needed in the automotive engine of the future, discussion of maintenance problems brought out; one for the combustion chamber and the water used therefor, and one for the crankcase oil. Lubricants for this purpose serve both as lubricants and cooling media, they said; the rapid increase in engine speeds and bearings pressures is making it more difficult to maintain the oil at the proper low temperature for cooling the bearings.

By a proper system of oil cooling, greater engine output may be obtained by reducing bearing drag by using lower viscosity oils, which when cooled will not reach a dangerous low viscosity with the higher temperatures reached by uncooled oil. Opinions differed as to how best to cool the oil. One speaker suggested that the cooling jacket water be carried entirely around the entire engine and crankcase enlarging the water system to handle the additional heat removal load. Another suggested conducting the oil through a section of the radiator entirely separated from the water section. All were agreed that with the present trends in passenger-car body design, the engine cooling problem is becoming a near-nightmare. All also agreed that the most sensible thing is to cool the oil which serves to cool all that portion of the engine not cared for by the water; we cool the water, but we do not cool the oil which serves as important a cooling purpose, they stated.

Changes in volatility quality of house-



Mr Dubbs runs a service station that bears that sign in Marion, Iowa

He didn't invent the cracking process—he is another Mr Dubbs

He calls it Dubbs gasoline just because he sells it He doesn't say it's cracked—perhaps he doesn't even know it

But it *is* Dubbscracked gasoline that he sells just the same

Mr Dubbs is lucky—it's a great name in the oil industry

You are lucky, too, if you have Dubbscracked gasoline to sell

Just tie in your name with the Dubbscracked name and you can make it mean much to the motorist

And to your business

Universal Oil Products Co
Chicago, Illinois

Dubbs Cracking Process
Owner and Licensor

brand gasolines have been preceded, during the last three years or so, by corresponding and earlier changes in the same points in premium gasolines, R. C. Alden and D. G. Proudfoot, Phillips Petroleum Co., said in discussing seasonal improvements in gasoline and lubricating oils. If this tendency continues the present decidedly low 50% and 90% points in the distillation curves of premium gasolines presage an increase in the volatility of housebrand motor fuels in the near future, they stated.

Bringing up to date the volatility studies by the authors, and by Becker and Bauer in 1935 (Natural Gasoline Association of America, May, 1935), these investigators stated that since 1934 the annual average vapor pressure has increased rapidly, increases showing in each quarter of the year except the second. Housebrand gasolines show the highest vapor pressure, premium next, and third grade lowest. During the eight years since 1929 very little change in seasonal front-end volatility has occurred except that average vapor pressures are somewhat higher.

As for the 50% point, the annual average temperature has been practically constant since 1934, but with greater changes in seasonal trends. Since that date the first, second and fourth quarter fuels have continued the decline while the third quarter samples show an increase in the midpoint temperatures. The 50% point of winter gasolines generally has been decreasing, while that in summer has slowly increased.

The 90% point of housebrand on the average has remained practically constant at about 343° F., they said. Premium fuels show a greater seasonal variation at this point than do housebrand gasolines with much higher volatility at the 90% points of premium fuels. Third grade fuels show a much higher 90% evaporated temperature than in 1934, they find.

If we are to continue to use private airplanes which are operated at only two to two and one-half times the ground speed of automobiles, flying low and slow, the most of the new developments in aviation are of no interest to the designer and owner of private-operated planes, Mac Short of the AiRover Co., California, stated in discussing the present progress in this type of plane. But if we may take advantage of high flying altitudes and faster speeds made possible by new developments to drive such planes at three times automobile speeds or higher, we may expect that many of the new devices for safer landing, better take-off, higher engine powers and efficiencies, automatic and semi-automatic operating control, radio equipment to be added to privately-owned planes. "He can continue to fly as safely, or more so," Shore said referring to the private plane operator, "at speeds up to 200 miles an hour, as his neighbor driving on the crowded highway."

One of the most important devices which will enable the private owner to use planes of 200 miles-per-hour cruising speeds is the use of landing flaps, automatic or semiautomatic, to reduce landing speeds to the conventional 50 miles per hour required; this speed is safer than in 1936, but regulations will not permit it to be increased, he stated. As developments permit higher powered engines and higher speeds, the privately-operated plane should be permitted to fly at higher levels, obtaining the greater efficiency or speed of flight which higher altitudes make possible. Higher powers also permit greater wing loadings, up to 18 pounds per square foot being common now. Increases in permissible plane weight facilitate the improvement of air conditioning cabins, sound-proofing and passenger comfort, adding to the desirability and pleasure of plane travel, Short pointed out. On this point, he referred to the cost of removing weight from the plane as ranging from $10 to more than $50 per pound.

Arch F. Campbell, Waukesha Motor Co., who presented facts regarding diesel development, and the Hesselman spark ignition oil engine at Tulsa

Tulsa U. Wins Debate

Repeating the innovation of last year's southwest regional meeting, the 1937 meeting in Tulsa enjoyed a hotly contested debate between three-man teams from Tulsa University and University of Oklahoma, which resulted in a unanimous decision by five judges in favor of Tulsa U.'s team. The winning team had the affirmative of the question, "Resolved; That the diesel type engine may be more desirable than the gasoline engine for automotive equipment."

Members of each team will be given complimentary students' memberships in the Society of Automotive Engineers for one year, C. B. Veal, research director for the Society announced after the close of the debate.

Sign For Oil's Exhibit at New York World Fair

Officials of the recently organized Petroleum Industry Exhibition, Inc., formed to work up a joint exhibit of 13 oil companies for the New York World's Fair in 1939, meet with Grover Whalen, president of the Fair, to sign a contract for participation. Left to right, Thomas H. Taylor, Standard Oil Co. of New Jersey, president of the Petroleum Industry Exhibition, Inc.; Mr. Whalen; E. E. Puryear, The Texas Co., a vice president of the petroleum exhibition company. Standing is Thomas K. Schmuck, of counsel of The Texas Co.

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Oil Case Will Be the Biggest Anti-Trust Suit in History

By **A. M. PETTY**
N. P. N. Staff Writer

• • •

BANNER headlines will flash across newspaper front pages in a few days when trial of the so-called oil conspiracy case gets under way at Madison, Wis.

WASHINGTON, Oct. 2

Although the biggest anti-trust suit in history, bigger even than the government's suit a quarter of a century ago to dissolve the so-called Standard Oil trust, the Madison case so far has progressed practically unnoticed by the press generally.

The newspaper headlines announcing opening of the trial will surprise 90 per cent of the general public because, outside of the oil industry, few people have even heard of the Madison case, despite the number and size of the oil companies involved. Several of the defendant companies individually are larger than was the Standard Oil Co. of New Jersey before the dissolution in 1911.

Three months will be the duration of the Madison trial, in the opinion of Judge Patrick T. Stone, of the U. S. District Court for western Wisconsin, before whom the case will be tried.

However, if the Madison case drags out as long as the Standard dissolution suit it will be 1942 before it is finally decided. Regardless of which side wins—barring a nolle prosse, plea of guilty, or other summary termination of the trial—the case probably will reach the U. S. Supreme Court for final action.

The Madison case dates back to the days of the NIRA and the oil code. Some months before the Supreme Court killed the Recovery Act and all its codes in the Schechter decision, there were mumblings of discontent among Independent oil jobbers and dealers at some of the measures to "stabilize" marketing conditions under the famous letter of July 20, 1934, of Interior Secretary Harold L. Ickes, then oil administrator, to Charles E. Arnott, Socony-Vacuum Oil Co., then chairman of the marketing sub-committee of the Planning and Co-ordination Committee. This lettter purported to give authority to committees of the industry to co-operate in doctoring sore spots in the oil marketing picture.

A group of Independent oil jobbers from many sections, members of the National Oil Marketers Assn., met in Washington on June 17, 1935—about three weeks after the NIRA died—and appointed a committee to call upon Attorney General Homer S. Cummings and ask the Department of Justice to investigate and determine if there were any secret agreements, in violation of anti-trust laws, among refiners to fix jobber margins.

Members of the jobbers' committee were: G. D. Givens, Home Oil & Gas Co., Henderson, Ky., chairman; J. Marshall Thompson, General Oil Products, De Soto, Mo.; W. M. Jacobson, of H. K. Stahl Co., Minneapolis; and Fred E. Bergfors, Quincy (Mass.) Oil Co.; and Paul E. Hadlick, secretary of the N. O. M. A.

Cummings heard the jobbers' complaint on June 18, 1935, and then arranged for a conference with them and Harold M. Stephens, then assistant attorney general in charge of the department's anti-trust division.

Stephens, who is now a federal judge, is said to have promised the jobbers a grand jury investigation if needed to get the facts about the matters complained of.

Attorney General Cummings told newspapermen on August 1, 1935, that the oil anti-trust investigation was well under way. Shortly thereafter G-Men from the department's Federal Bureau of Investigation began to show up in various parts of the country, questioning jobbers about their relations with their sources of supply.

Meanwhile, a legislative committee in Michigan, appointed to investigate conditions in oil marketing in that state, was hearing jobbers' complaints against the major oil companies operating in that state. This testimony, filling about 2000 pages, was turned over to the justice department and the Michigan group joined hands with the National Oil Marketers Assn. to press the federal investigation.

Late in March, 1936, State Senator Joseph A Baldwin, chairman of the Michigan legislative committee, publicly chided the Justice Department for its "delay" in the oil probe. Cummings countered April 9 with the statement that Baldwin didn't know what he was talking about and that a grand jury would be impaneled shortly to continue the oil inquiry.

Criminal Action

In view of the criminal action taken as a result of the grand jury probe at Madison, Cummings' statements at the time it was impaneled about the improbability of indictments being returned, is interesting.

Here is the account of Cummings' April 9 press conference as published in NATIONAL PETROLEUM NEWS of April 15, 1936:

"The department's decision to conduct a grand jury investigation does not necessarily mean that indictments will result, the attorney general emphasized. But it will afford an opportunity to subpoena witnesses, books and records and other data which otherwise might not be available, he explained.

"Asked what was the nature of the charges involved, Cummings answered vaguely—'All sorts of charges; improper practices, price questions and other violations of the anti-trust laws.'

"Several times during his announcement, which was made to about a dozen newspaper correspondents, Cummings reiterated that the grand jury investigation and issuance of subpoenas does not imply that indictments will follow. He cautioned the correspondent against letting any such implications creep into their stories."

Cummings declined to reveal at the time where the grand jury investigation would be held. Later, it was announced that the grand jury would sit at Madison and that it would begin its inquiry on May 4.

Why the government chose Madison as the scene of the grand jury oil investigation caused much speculation. In-

23 Oil Companies Cited To Appear For Trial

The following oil companies were indicted by the federal grand jury at Madison in July, 1936, on the conspiracy charge, trial of which was set to start Oct. 4 in federal court there:

Standard Oil Co. (Indiana)
Socony-Vacuum Oil Co., Inc.
Cities Service Co.
Continental Oil Co.
Gulf Oil Corp.
Pure Oil Co.
Shell Petroleum Corp.
Sinclair Refining Co.
The Texas Co.
Tide Water Oil Co.
Mid-Continent Petroleum Corp.
Phillips Petroleum Co.
Skelly Oil Co.
Barnsdall Refining Corp.
Globe Oil & Refining Co. (Okla.)
Globe Oil & Refining Co. (Ill.)
Globe Oil & Refining Co. (Kans.)
Deep Rock Oil Corp.

Subsidiary Companies

Cities Service Export Co.
Empire Oil & Refining Co.
Louisiana Oil Refining Corp.
Gulf Refining Co.
Wadhams Oil Co.

deed, at a press conference several months later the Associated Press representative fired the question point-blank at Attorney General Cummings. Here is the A. P. man's question and Cummings' reply, taken from NATIONAL PETROLEUM NEWS of Aug. 19, 1936.

" 'Mr. Attorney General, why was Madison selected as the place to hold this grand jury investigation? There is no oil in Wisconsin. The suggestion has been advanced that the Justice Department selected Madison because the jurors there might be a little more sympathetic to the government's case. Can you tell us why Madison was chosen instead of some place in Texas or Oklahoma?' "

"Attorney General Cummings puffed on his cigar for a moment and then replied:

" 'I believe that same question was asked when we first announced (in April) that the grand jury investigation would be held at Madison. I will try to answer it in the same way I did then.'

" 'The conspiracy which the government claims existed affected 10 states, including Wisconsin. There was technical jurisdiction in any of those states.'

" 'We looked into the court dockets and found that conditions in the western judicial district of Wisconsin were under less pressure than some other districts. The court and judge were available.'

" 'Perhaps Chicago would have been the logical place, but there were difficulties in the way—facilities for grand jurors and other questions.'

" 'We might have gone to Detroit but there was great feeling there against persons who might be indicted as a result of the grand jury investigation. We received many complaints from independent oil jobbers in the Detroit area—'

"At this point, the newspaperman who had asked the question interrupted to remark: 'Then the attitude of the jurors did influence your choice of a place to hold the grand jury investigation?'

"Cummings replied:

" 'Our only purpose was to find a convenient spot — where the jurors would not have either an adverse or favorable attitude toward the investigation. On the

The Federal Building, in Madison, Wis., where the oil conspiracy trial is scheduled to start Oct. 4. The courtroom is on the second floor. Special preparations have been made for handling the trial, which it is expected will run from ten weeks to three months

58 Indicted, 10 Not Summoned To Appear Oct. 4 for Trial

The following individuals were indicted by the federal grand jury at Madison in July, 1936, on conspiracy charges, trial on which was to start Oct. 4 at Madison:

Edward G. Seubert, Chicago, president Standard Oil Co. (Indiana).

Allan Jackson, Chicago, vice president in charge of sales, Standard Oil Co. (Indiana).

Edward J. Bullock, Chicago, vice president in charge of purchasing, Standard Oil Co. (Indiana).

Ira A. Smith, Tulsa, buyer, Standard Oil Co. (Indiana).

John A. Brown, New York, chairman of executive committee and president Socony-Vacuum Oil Co. Inc.

Chas. L. Jones, New York, vice president in charge of domestic trade department, Socony-Vacuum Oil Co. Inc.

Chas. E. Arnott, New York, vice president, Socony-Vacuum Oil Co. Inc.

H. T. Ashton, St. Louis, manager of Lubrite Division, Socony-Vacuum Oil Co. Inc.

A. G. Maguire, Milwaukee, chairman board of directors, Wadhams Oil Co.

R. R. Irwin, Kansas City, manager White Eagle Division, Socony-Vacuum Oil Co. Inc.

Bryan S. Reid, Chicago, general manager, Chicago division, Socony-Vacuum Oil Co. Inc.

Frank R. Coates, New York, vice president, Cities Service Co., and Empire Oil & Refining Co.

Harry D. Frueauff, Tulsa, vice president, Cities Service Co., Empire Oil & Refining Co., and Louisiana Oil Refining Corp.

H. E. Brandli, New York, vice president and general manager, Cities Service Export Oil Co.

O. J. Tuttle, Tulsa, tank car sales manager, Empire Oil & Refining Co.

D. W. Harris, Shreveport, general manager, Louisiana Oil Refining Corp.

John A. Welch, Shreveport, sales manager, Louisiana Oil Refining Corp.

Dan Moran, Ponca City, president, Continental Oil Co. (Del.).

Harry J. Kennedy, Ponca City, vice president in charge of marketing, Continental Oil Co. (Del.).

L. T. Cramer, Ponca City, tank car buyer, Continental Oil Co. (Del.).

Edward Karstedt, Denver, formerly vice president, Continental Oil Co. (Del.).

J. F. Drake, Pittsburgh, president, Gulf Oil Corp. and Gulf Refining Co.

Wm. V. Hartmann, Pittsburgh, vice president, Gulf Oil Corp. and Gulf Refining Co.

H. C. Meyer, Pittsburgh, Gulf Oil Corp. (title unknown)

O. H. Carlisle, Houston, Gulf Oil Corp. (title unknown)

Henry M. Dawes, Chicago, president Pure Oil Co.

C. B. Watson, Chicago, vice president, Pure Oil Co.

R. H. McElroy, Jr., Chicago, tank car sales manager, Pure Oil Co.

Dewey K. Chamberlain, Tulsa, manager, Tulsa Division, Pure Oil Co.

R. G. A. Van der Woude, New York, president, Shell Union Oil Corp.

Alexander Fraser, St. Louis, president, Shell Union Oil Corp.

P. E. Lakin, St. Louis, general manager of sales, Shell Union Oil Corp.

E. W. Sinclair, New York, president, Sinclair Refining Co.

J. W. Carnes, New York, vice president, Sinclair Refining Co.

W. S. S. Rogers, New York, president, The Texas Corp.

R. D. Cottingham, New York, assistant to president, The Texas Corp.

H. W. Dodge, New York, vice president in charge of sales, The Texas Corp.

P. C. Scullin, Houston, vice president and general manager, Indian Refining Co. (subsidiary of The Texas Corp.)

Edward L. Shea, New York, president, Tide Water Oil Co.

Noel Robinson, New York, vice president, Tide Water Oil Co.

J. W. Warner, Tulsa, Tide Water Oil Co. (title unknown)

R. O. Audrain, Tulsa, buyer, Tide Water Oil Co.

Jacob France, Baltimore, president and general manager, Mid-Continent Petroleum Corp.

Robert W. McDowell, Tulsa, vice president in charge of sales, Mid-Continent Petroleum Corp.

Thomas Fitzgerald, Tulsa, assistant to vice president in charge of sales, Mid-Continent Petroleum Corp.

Frank Phillips, Bartlesville, president, Phillips Petroleum Corp.

H. E. Koopman, Bartlesville, vice president in charge of purchases Phillips Petroleum Corp.

A. M. Hughes, Bartlesville, sales manager, Phillips Petroleum Corp.

H. A. Gardner, Bartlesville, tank car sales manager, Phillips Petroleum Corp.

W. G. Skelly, Tulsa, president, Skelly Oil Co.

James Nagle, Tulsa, in charge of wholesale sales, Skelly Oil Co.

Edward B. Reeser, Tulsa, president, Barnsdall Oil Co.

I. A. O'Shaughnessy, Minneapolis, president, Globe Oil & Refining Co.

Bernard L. Majewski, Chicago, vice president in charge of sales, Deep Rock Oil Co.

Keith Fanshier, Chicago, petroleum editor, Chicago Journal of Commerce.

Warren C. Platt, Cleveland president, *Platt's Oilgram* and NATIONAL PETROLEUM NEWS.

Clyde M. Boggs, Arkansas City, Kans., president, Western Petroleum Refiners Assn.

Arthur V. Bourque, Tulsa, secretary and treasurer, Western Petroleum Refiners Assn.

The following 10 of the above 58 defendants were not served with orders to appear before the U. S. District Court at Madison for trial Oct. 4:

Frank R. Coates, New York, Cities Service Co.; J. F. Drake, Wm. V. Hartmann and H. C. Meyer, Pittsburgh, and O. H. Carlisle, Houston, Gulf Oil Corp.; Edward Karstedt, Denver, Continental Oil Co.; B. L. Majewski, Chicago, Deep Rock Oil Co.; John A. Brown, Socony-Vacuum Oil Co., Inc.; D. W. Harris, Shreveport, Louisiana Oil Refining Corp.; Keith Fanshier, Chicago Journal of Commerce.

whole, Madison, Wisconsin, appeared to fulfill this requirement.' "

For many months, W. B. Watson Snyder, anti-trust division attorney with years of experience in oil matters behind him, was the wheelhorse of the oil investigation. He sat in with Stephens in the first conference with the N. O. M. A. delegation. Early in 1936, however, when the scent grew hot, three other attorneys were assigned to the case. They were John Henry Lewin, formerly with the Agricultural Adjustment Administration; Hammond E. Chaffetz, appointed to the anti-trust division in 1931; and Grant Kelleher, 1934 appointee in the anti-trust division.

These four attorneys conducted the grand jury investigation. With William P. Crawford, Superior, Wis., lawyer hired specially for the oil case, and two other department attorneys, they will conduct the trial.

Col. William J. Donovan, chief counsel for the group of defendants in the oil conspiracy case. He is 54 years old. Received his training at Columbia University. During the War he served with a New York infantry regiment, of which he became colonel. Wounded three times in service overseas and the only man to receive the Distinguished Service Cross, Distinguished Service Medal and Congressional Medal during the War. In 1922, after serving in various missions abroad, he became U. S. Attorney for the Western District of New York. In 1924 Coolidge named him U. S. Assistant Attorney General in charge of criminal matters and in 1925 he became Assistant Attorney General

The grand jury sat from May 4 to June 16, then recessed until July 7. On July 28, 1936, it handed down the first indictment which was entitled **U. S. vs. Standard Oil Co. (Indiana) et al.**

This indictment, naming as defendants 23 oil companies, three trade publications, and 58 individuals, charged a conspiracy to fix tank car prices of gasoline in the midwestern states, or what is termed the Standard of Indiana territory.

In furtherance of this "conspiracy", the indictment alleges that the defendant oil companies engaged in two programs to buy gasoline from Independent refiners, described as the East Texas and Mid-Continent buying programs. Purchases from Independent refiners in the East Texas area allegedly were handled through the East Texas Refiners' Assn., with the sellers allegedly agreeing to curtail their production of gasoline as part of the bargain.

Such purchases, the indictment charged, were in excess of what the defendant companies ordinarily would have bought, except for their participation in the buying program, and the prices paid were "uniform, high, arbitrary, and non-competitive," the indictment read.

The Mid-Continent buying program, according to the indictment, involved similar purchases from small refiners in Oklahoma and other Mid-Continent areas. It was charged that monthly meetings were held and to each of the larger companies participating were assigned one or more independent refiners as "dancing partners", from whom they purchased quantities of gasoline as recommended by the persons directing the buying, according to the indictment.

The defendant oil companies were charged with adopting uniform jobber contracts and virtually identical provisions governing terms and conditions of sale, namely, that the price to the job-

Previous Oil Anti-Trust Suits Brought By U. S.

Summarized below are the principal oil cases which have been brought by the U. S. Department of Justice charging violation of federal anti-trust laws.

They do not include other federal cases, such as the Federal Trade Commission's unsuccessful suit to outlaw loaning of gasoline pumps; nor do they include state legal actions, such as the Texas ouster suit against the American Petroleum Institute, Standard Oil Co. of N. J., and a number of other major oil companies, based on charges of violating Texas anti-trust laws by adhering to the 1931 oil code approved by the trade commission.

U. S. vs. Standard Oil Co. of New Jersey. Petition filed in federal court for northern district of Illinois Nov. 15, 1906, to dissolve the so-called Standard Oil trust; dissolution decree entered July 29, 1911, after defendants' unsuccessful appeal to U. S. Supreme Court.

U. S. vs. Colvin N. Payne et al. Indictment returned in northern district of Texas, Aug. 29, 1912, charging price-fixing; nolle prossed. (This was a federal action at the time of the state ouster suit in the Waters-Pierce Oil Co. case.)

U. S. vs. Standard Oil Co. (Indiana) et al. Petition filed June 25, 1924, to break up the so-called Patent Club; also known as the "cracking case". U. S. Supreme Court threw it out in 1931 on appeal by defendants after lower court had upheld government's contentions.

U. S. vs. Standard Oil Co. of New Jersey, et al. Petition to block merger of Standard Oil Co. of New York and Vacuum Oil Co. filed March 24, 1930, in eastern district of New York; decided against the government Feb. 7, 1931. In this case the government decided not to appeal.

U. S. vs. Standard Oil Co. of California, et al. Petition filed Feb. 15, 1930, in northern district of California charging 19 oil companies with price-fixing. Consent decree entered Sept. 15, 1930.

Judge Stone, Hearing Oil Trial, Is Roosevelt Appointee

Federal Judge Patrick T. Stone, who will preside at the oil conspiracy trial which opens in Madison, Oct. 4 has been a judge only a little over four years. He is 48 years old.

He was born in Pembrocke, Ont., his parents moving to Tomahawk, Wis., when he was only two years old. A graduate of Marquette University law school, in Milwaukee, he practiced law in Wausau beginning in 1912, until he mounted the federal bench for the western district of Wisconsin in June, 1933.

During the World War Judge Stone served in the navy, and he is active in American Legion affairs. He served as city attorney of Wausau for eight years, the only public office he held until Roosevelt appointed him as judge.

Chief Justice Hughes of the U. S. Supreme Court, appointed him to try two Detroit bankers, after Michigan federal judges had been disqualified for several reasons.

The western district of Wisconsin covers most of the territory of the state, and Judge Stone holds court during the year at Madison, seat of the state government, at La Crosse, 150 miles away on the Mississippi river, at Superior, more than 300 miles from Madison, at the head of Lake Superior, and at Wausau, his home town, in the center of the state.

His chief diversion in the summer is steering his sailboat over the waters of a lake near Tomahawk, where he has a summer home. Last summer he went to the village of Tomahawk to get a small metal part for his sailboat, and saw a larger boat which took his eye. He promptly bought the new boat.

In the courtroom Judge Stone is patient with attorneys and witnesses, until he feels that they are not telling the truth, or are wasting time in repetitious argument. Then he "cracks down" in vigorous phrases.

"MURDER RUNS" give truck and bus tires their worst punishment. On these runs, terrific internal heat is generated by heavy loads carried at sustained high speeds over long distances. The Beatrice Steel Tank Manufacturing Co., of Beatrice, Neb., hauls sheet steel and heavy steel tanks and pipes over a wide area. An average trip is 425 miles. Conventional tires, even Goodyears, never topped 25,000 miles—often failed at 12,000. But now a set of the sensational new Goodyear YKL Tires, built with Rayotwist, has 65,000 miles to its credit.

"TEN TONS ON A 'MURDER RUN' . . . SURE, THAT'S TOUGH ON TIRES, BUT— I HAUL GAS AND OIL ON CITY STREETS"

MAKE NO mistake about this: Most trucking operations have no need for a super-tire such as the new Goodyear YKL.

But every truck owner wants the greatest mileage per dollar that he can get from his tires.

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The same Goodyear engineers who developed the YKL for the "murder runs" have produced many other types of truck tires, each one for a specific type of work.

Probably the tire for you is the Goodyear All-Weather Balloon—a tire as perfectly suited to your work as the YKL is to the "murder runs".

The All-Weather Balloon has the *All-Weather Tread* for greater traction and non-skid protection; *Supertwist Cord* in every ply for longer, trouble-free service; and many other features which combine to give you tire economy such as you have never before experienced.

Because Goodyear builds a tire specifically fitted for your use, another for the "murder runs" and still others for every type of specialized service, you display good buying judgment when you heed this advice:

Put Goodyears—the *right* Goodyears—on *any* job *and watch your mileage jump!*

CAUTION! The new Goodyear YKL is recommended only for the most destructive type of service—for the "murder runs" over long distances at sustained high speeds. In ordinary trucking, its extraordinary capacities cannot be fully utilized—and, frankly, its higher price cannot be justified.

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RISING truck tire prices took a knockout blow when Goodyear announced the sensational new Goodyear R-1 a few weeks ago.

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If low initial cost is important—*and you want quality at low cost*—this may be just the tire you're looking for.

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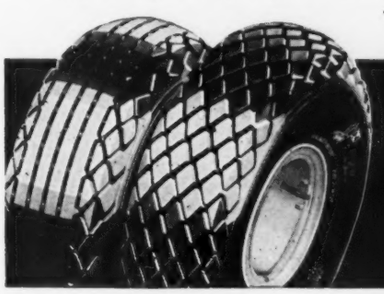

GOODYEAR TRUCK TIRES

SAVE MONEY WITH GOODYEAR BATTERIES, RIMS, FAN BELTS AND RADIATOR HOSE

Government Counsel in the Oil Cases

The three representatives from the U. S. Department of Justice who prepared the government's oil conspiracy cases and presented it to the federal grand jury in Madison. They are scheduled to take an active part in the trial starting Oct. 4. Left is John Henry Lewin, Harvard law school graduate, appointed Special Assistant to the U. S. Attorney General, in the anti-trust division in October, 1933. Also seated is Hammond E. Chaffetz, who has been a Special Assistant in the Attorney General's office since 1931. Standing is Grant Kelleher, appointed a Special Attorney, in the anti-trust division, in 1934

ber would be the average high and low spot market prices for gasoline as published by Platt's Oilgram and the Chicago Journal of Commerce.

In other words, the indictment charges that, .through the "buying programs", the spot market price, on which the jobbers' contracts were based, was artificially raised.

The indictment alleges further that the quantity of gasoline sold in spot sales by independent refiners was less than 5 per cent of all gasoline sold in the mid-western area.

In addition to Platt's Oilgram, the indictment named also as a defendant NATIONAL PETROLEUM NEWS, stating that it published a weekly compilation of prices as published by Platt's Oilgram.

The trade journals were charged with knowing of the alleged conspiracy and aiding the defendants by publishing prices paid by the major oil companies in the "buying programs" and falsely representing that they were prices prevailing in spot sales in tank car lots to jobbers.

After hearing more witnesses, the Madison grand jury handed down another indictment on Nov. 6, 1936, which named as defendants 24 oil companies and 46 individuals. All but three of the defendant companies in the first indictment were named in the second indictment. The three left out were Gulf Oil Corp., Cities Service Export Oil Co., and Louisiana Oil Refining Corp. However, four new defendant companies were brought into the second indictment. Some of the individual defendants were left out of the second indictment while new ones were added.

None of the trade journals or their editors were named in the second indictment, which charged agreements to fix margins and adopt uniform contracts and policies regarding jobbers in the ten midwestern states comprising the so-called Standard of Indiana territory.

Trial of the second case, entitled **U. S. vs. Socony-Vacuum Oil Co.,** has been deferred until after the so-called oil conspiracy or buying program case has been disposed of.

Defendants quickly began forming their lines of defense. Col. William J. Donovan, New York, former assistant attorney general in charge of the anti-trust division during the administration of President Coolidge, was selected as chief counsel for 18 of the defendant oil companies.

Col. Donovan exploded a bombshell in Judge Stone's courtroom on Dec. 7, 1936, by filing a plea in abatement charging irregularity in the selection of the grand jury.

For awhile, it appeared that both indictments might be thrown out. The old grand jury was discharged on Dec. 11, and a new jury was impaneled Dec. 15. Government attorneys presented evidence to the new jury and on Dec. 22 two new indictments were returned which were virtually the same as those handed down July 28 and Nov. 6, rspectively.

The old indictments have never been thrown out, but government counsel has elected to try the defendants in the "buying program" or Standard of Indiana case under the Dec. 22, 1936, indictment, which is numbered 11365.

Defendants have attacked the indictments from many angles in many and varied legal maneuvers — pleas as to the court's jurisdiction, demurrers, pleas in bar, and others — but one and all have been overruled.

By agreement among counsel for many of the defendants and the government attorneys, many of the defendants dropped their proceedings contesting removal to Madison for trial; other defendants had already waived any contest of removal.

However, some defendants, notably officials of Gulf Oil Corp., have fought removal proceedings and, although losing out in the lower courts, are carrying appeals to higher courts with the result that they were not scheduled for trial Oct. 4.

Madison, Scene of Oil Trial, Is Colorful College Town

Madison, Wis., the oil marketing capital for the duration of the federal conspiracy trial starting Oct. 4, celebrated its hundredth birthday last summer. It is a typical midwestern college and state capital city, of 60,000 population. It has a large number of state employes and 10,000 students. It is 75 miles due west of Milwaukee and 140 miles northwest of Chicago.

Four lakes are claimed for the Madison region and the city is built between two of these, Mendota to the north and Monona to the south. At the narrowest point these lakes are some seven blocks away, the distance widening to the east and west.

The state capitol is in a park, two blocks square, about midway between the lakes at this narrowest point, and is the center of the city. The main retail business district centers around capitol square.

To the east of capitol square is the city's small industrial section, and north of this section along Lake Mendota is the older better residential section.

The federal building, where the oil conspiracy trial will be held, is midway between the capitol and Lake Monona.

A mile directly west of the square the University of Wisconsin campus starts. To the south of the university and east is the rooming house section, and much retail business for the student trade. The fraternity and sorority section is just east of the campus, along Lake Mendota.

A major feature of interest for visitors, during the fall, are the colorful football games of the University of Wisconsin. Home games are Iowa Oct. 16, Northwestern Oct. 30 and Purdue Nov. 13. The Iowa game is Homecoming for alumni and visitors and the town will be in gala dress.

THE WORLD'S 2 BIGGEST AIRPLANE CARRIERS ARE THE SAME SIZE

But the WORLD'S BIGGEST MAGAZINE is TWICE the size of the second biggest!

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Each week The American Weekly is bought and read by 6,000,000 families—*twice* as many as read any other magazine. And, what's even more important, this tremendous circulation is concentrated in the country's most active buying areas . . . in the 631 counties where 68% of *all* the nation's families live and where 80% of *all* retail sales are made. In these 631 counties are located *all* cities of 10,000 or more population, in most of which The American Weekly regularly reaches from 1 out of 5 . . . to 1 or more of every 2 families. In short, The American Weekly produces the biggest consumer demand for products advertised in its pages because it reaches the greatest number of *buying families* in the greatest number of places.

6,000,000 WEEKLY CIRCULATION — NEAREST COMPETITOR CIRCULATION

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The American Weekly is the largest magazine in the world. It is distributed through the great Hearst Sunday newspapers. In 630 of America's 995 towns and cities of 10,000 population and over, The American Weekly concentrates 67% of its circulation.

In each of 196 cities, it reaches better than one out of every two families
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In an additional 124 cities, 30 to 40%
In another 164 cities, 20 to 30%

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THE AMERICAN WEEKLY

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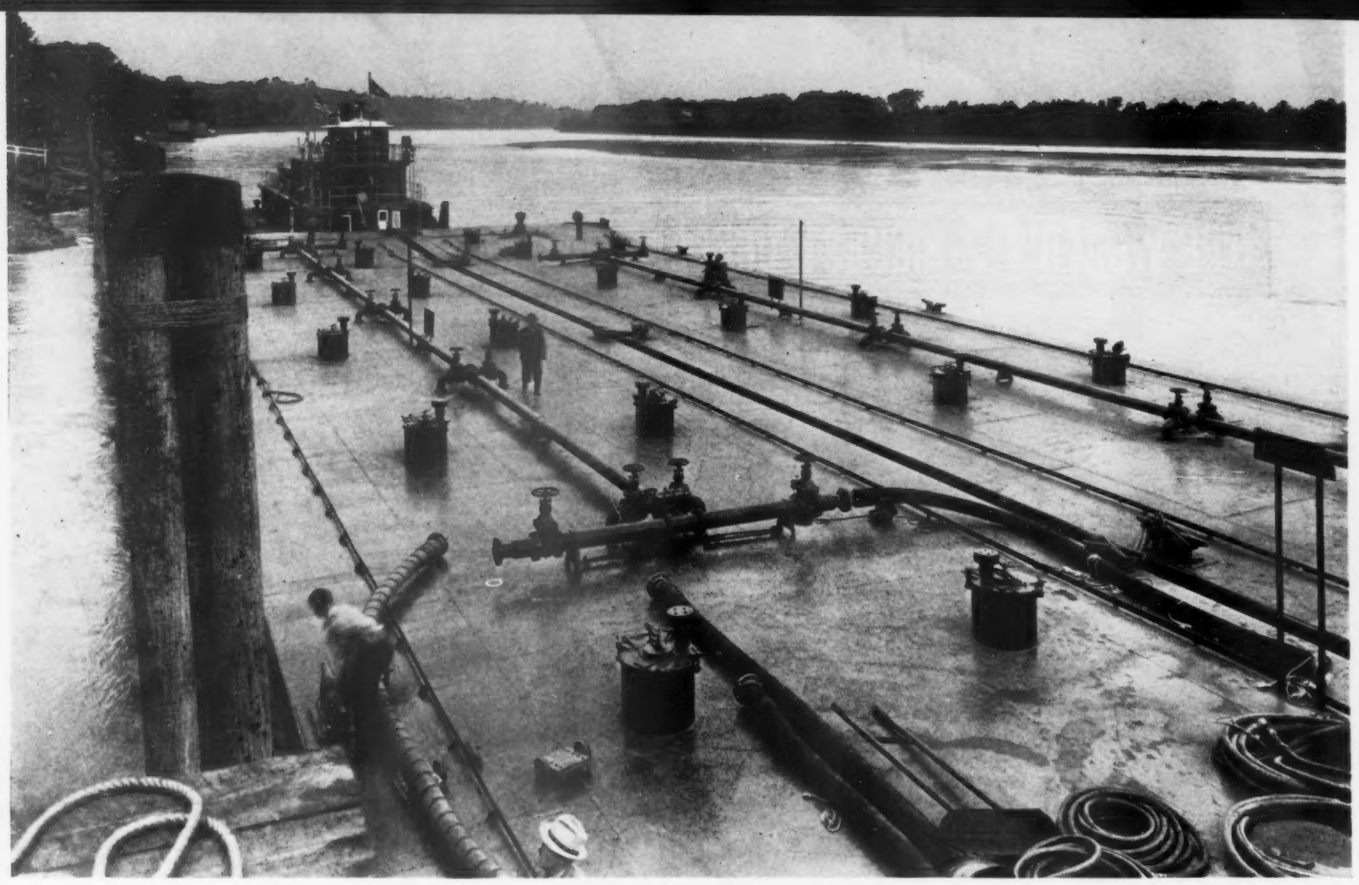

Moored to the dock for loading, the above-deck construction of the new oil barges of the White Eagle Division of Socony-Vacuum Oil Co., Inc., is shown. Each barge has 10 compartments with a manifold system so arranged that two barges can be loaded while tied together. The new towboat Kansas City Socony is shown moored to its dock

BARGING GASOLINE ON MISSOURI

Oil Company Becomes First Kansas City Concern To Use New Waterway, Being Now Able to Ship By Water as Far North as St. Paul

KANSAS CITY

WHEN a newly christened towboat pulled two equally new gasoline barges from a loading dock at Kansas City late in September, it closed the final gap in the approximately $2,000,000 program of the White Eagle Division of the Socony Vacuum Oil Co., Inc., to utilize the Missouri river for transportation of its products to key distributing points in its middle western marketing territory.

Hereafter a sizable portion of the light oils processed at the corporation's Augusta, Kans., refinery will move by pipeline to the new river terminal at Kansas City. Some of the products will be reshipped by rail to adjacent areas. The remainder will be moved by barge down the Missouri river and then up the Mississippi river to the new terminal at St. Paul, Minn., for reshipment by rail to final destination.

As soon as the channel is completed on the upper reaches of the Missouri river, which U. S. Army engineers estimate will be done within the next two years, the corporation probably will construct one or two terminals along that stream. Plans now are for construction at a later date of one or two additional terminals on the Mississippi river.

Thus the White Eagle Division of Socony Vacuum becomes the first private concern to make Kansas City a focal point for transportation of its products with its own equipment on the Missouri river's new waterway.

It is too early to say definitely just how much the new venture will save in transportation costs. Officials of the company have indicated, however, that "on paper" the savings will give a fair return on investment.

Many factors can affect the paper figures so easily that, until they know from actual experience the savings the new transportation method will provide, the officials are not going to reveal even the paper figures. One of the most important factors, it was pointed out, is the volume transported each trip. If the towboat handles its capacity load of six barges each trip, it was said, the cost per gallon of oil delivered will be materially lower than as if the boat handles only part cargoes.

Another factor will be the condition of the river channel. While the channel supposedly is 6 feet from Kansas City to Missouri river, the "dry" cycle in the middle west has created a low stage and the channel in places is around 5 feet. The new barges, fully loaded, require about 8 feet of water. Until the channel is deepened by fall and winter rains the barges cannot be filled to capacity. However, after the Fort Peck dam is completed, a sufficiently deep channel will be available at all times, according to U. S. Army engineers.

Still another factor in the cost picture will be the number of round trips the towboats can make in a season. The government barge lines operate eight months out of the year, from March 15 to Nov. 15. A private concern not dependent on common carrier freight, however, can operate as long as the rivers are open and an "open winter" naturally will permit more round trips per year.

It can be seen, therefore, why, with all those factors involved, White Eagle's officials are reluctant to "predict" savings until they are surer of their ground

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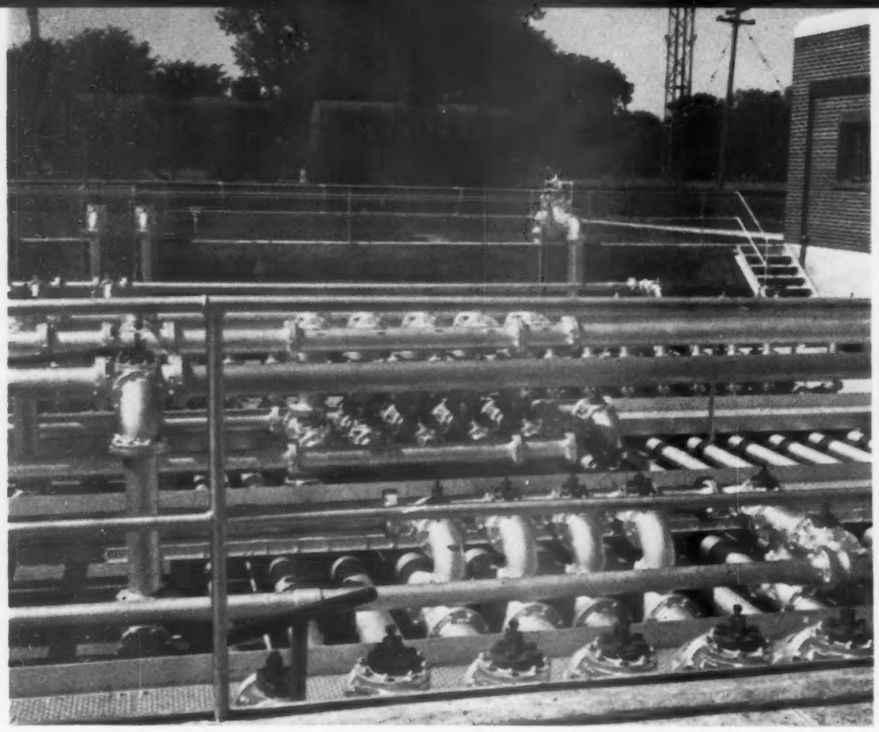

A maze of pipes in this manifold system, yet the top of each valve is painted a certain color and on each connection to the valve is stenciled in black letters what liquid belongs in that line

On the skids and ready to be launched, this electric welded barge slid into the Missouri river one day, was loaded the next and on the third day was on its maiden trip to St. Paul, for the White Eagle Division of Socony-Vacuum Oil Co., Inc.

Neatly lined up along the wall of the pump house at the river terminal in Kansas City, of the White Eagle Division, are the vapor proof switches which control the electric motors operating the pumps at the terminal and at the far end is seen the pipe line's manifold

through months of actual operating experience.

The first step in the program, leading to the barge movement of its products from Kansas City, was completed by the White Eagle Division about a year ago. This was the building of a 177-mile pipeline from the Augusta refinery to the river terminal at Kansas City.

The pipeline, of 6-inch tubing with welded joints, has one booster station near Emporia, Kans. When the line is not operated at capacity, however, the pumps at the refinery push the oils into the terminal without the booster station's aid.

The terminal is extremely modern. The 15 tanks, one of them spherical for natural gasoline storage, are coated with aluminum paint. The 14 regular storage tanks each are equipped with a floating roof to minimize evaporation losses.

One of the four small brick buildings on the terminal site houses the offices, a completely equipped testing laboratory, the heating plant for the terminal and the fire fighting system's pump and hose equipment.

Another building houses the terminal end of the pipeline with its manifold system; the battery of explosion proof electric motors and rotary pumps and the vapor proof control switches for the pump motors. Every safety precaution against fire or explosion apparently has been taken.

Adjacent to the pump house is the large concrete pit holding the complicated manifold system. The maze of pipes is kept bright with aluminum paint. Yet each valve is so marked with colored paint and stenciled at the base with large black lettering, that it would be virtually impossible for an operator to make a mistake in operating the valves.

Several light oils are moved through the pipeline from the refinery to the terminal's storage tanks, but each is so handled that there is no contamination of products.

One of numerous "safety" precautions against contamination is a gravity meter in the line where it enters the pump house. The dial records constantly the gravity of the oil passing through the line. By checking the dial the operator can tell immediately when one shipment has been completed and the first of another has reached the terminal.

A tank car loading rack sufficient to load 30 cars at one time has been equipped with modern loading equipment. All loading is done below the surface in the tank cars to reduce agitation and cut down vapor losses.

A 6-inch line is used for loading the barges. The line terminates at the loading dock with a "T" connection and two swing joints. This permits loading two compartments at one time.

The manifold system atop the barges also is so arranged that two barges can be loaded at the same time while tied side by side. Two hand operated cranes on the loading dock facilitate handling of

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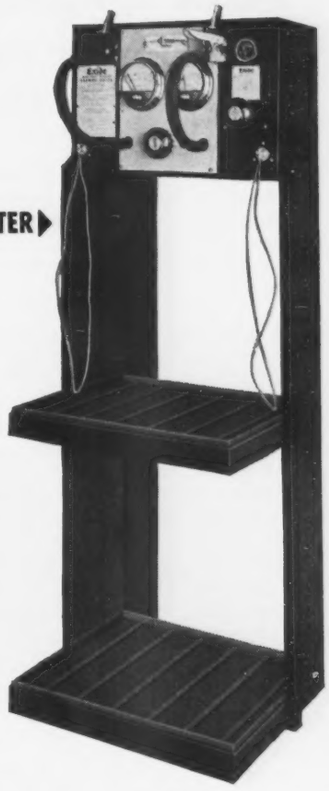

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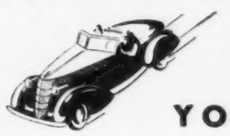

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the large rubber hose used to connect the pipeline's swing joints with the barge manifolds.

An interesting fact in connection with the construction of the towboat was the cutting in two of the hull and its removal by rail from a point six miles down the river to the site where it finally was completed. The boat company had started construction of the towboat and had the hull completed when White Eagle bought it. The boat company cut the hull in half crosswise and, by using two railway cranes to "swing" the half-hull between some of the telephone poles and light signal posts, managed to get the two sections to the new destination where they were rewelded and the remainder of the Diesel engine powered boat completed.

The towboat was named Kansas City Socony. Its two Diesel engines operating twin screw propellers develop sufficient power for the boat to handle six of the 400,000 gallon capacity barges at a time. It is expected to make the round trip from Kansas City to St. Paul in 23 days.

The two barges also were constructed in Kansas City by the builders of the towboat. They are all steel construction, electrically welded. Each has 10 compartments.

One of the barges was launched only two days before it started on its first trip to St. Paul.

Present plans call for construction of another towboat and six additional barges. One of the barges nearing completion at present will be equipped with a pump for emergency service. Plans call for one other barge to be similarly equipped. It was not deemed necessary to equip all barges with pumps, since the terminal at St. Paul has a discharge pump that will empty the barges at the rate of 1000 gallons per minute.

Tank Wagon Prices For 'Gas' Are Lower In TPD Contracts

N. P. N. News Bureau

WASHINGTON, Oct. 4.—Prices for gasoline by tank wagon delivery to federal agencies during the October-December quarter will be higher for "city zones" in the east but generally lower for cities in other sections, an analysis of contracts awarded by the Treasury Procurement Division disclosed.

Coinciding with lower prices in the new contracts was the fact that fewer Independent oil marketers won contracts this time.

Of the 46 cities which constitute zones by themselves, the government will pay higher prices for gasoline in 15 cities as compared with the current contract for the July-September quarter, lower prices in 22 cities and the same prices in 9 others.

Twelve of the 15 cities with higher prices are in the east. In virtually all of the south-eastern cities, prices were lower or the same as compared with the July-September contracts.

In every mid-western city, with two exceptions, prices were lower; the two exceptions were Louisville and Des Moines where the prices are unchanged.

Chicago Price Lower

The Chicago contract, for instance, went to Sinclair Refining Co. for the October-December quarter at 7.12 cents for Sinclair H-C gasoline. The July-September contract was held by Jewett & Sowers, Chicago independent marketers at 8.3 cents.

Several Independent marketers, who have been regularly winning contracts for "city zones," repeated for the October-December quarter. But other "regulars" lost out this time, although other Independents took over the contracts.

Bridgeport went back to McElligott Fuel Corp., Waterbury, while New Haven was recaptured by Radcliffe Oil Co., New Britain.

Pennsylvania Oil Co., Boston, lost the Worcester contract to Colonial-Beacon Oil Co. (Standard of N. J.) but again received the Boston award. D. & L. Oil Sales Co., Newark, retained the Jersey City and Newark contracts.

Powerful Petroleum Corp., a newcomer, won the Cincinnati contract, Navy Gas & Supply Co., of Denver, and Superior Petroleum Co., of Louisville, regained the contracts for their respective cities.

Sinclair Big Winner

Sinclair was the big winner taking 13 of the awards for "city zones."

Summarized herewith are contracts for the 16 "city zones," covering tank wagon delivery of V-68 (regular) gasoline during October, November and December. Following the city name is the Treasury Procurement Division's estimate of the gallonage to be bought under the contract during the three-month period, then the name of the contractor, posted price bases, maximum price and brand name. If the discount off the posted price at the time of delivery is lower than the maximum price quoted, the government will buy on that basis; if not, the maximum price will prevail.

Tank Wagon Gasoline Awards in Cities, Oct.-Dec. Quarter

(All contracts awarded are for V-68 grade of motor fuel, corresponding generally to "regular" grade, with minimum of 68 octane.)

Bridgeport, Conn., 10,000 gals. McElligott Fuel Corp., Waterbury, Conn., (tank car plus .25 cent) 7.95 cents for "Pea Green".

New Haven, Conn., 11,950 gals. Rackliffe Oil Co., New Britain, Conn., (tank car plus .5 cent) 8.35 cents for "Franklin Regular".

Baltimore, 62,670 gals. Standard of New Jersey, (tank car flat) 8.15 cents for "Essolene".

Worcester, Mass., 9,200 gals. Colonial Beacon, (tank car plus .49 cent) 8.25 cents for "Essolene".

Boston, 130,750 gals. Pennsylvania Oil Co., Boston, Mass., (tank car plus .5 cent) 7.83 cents for "Powerful Penn".

Jersey City, N. J., 22,000 gals. D. & L. Oil Sales Co., Newark, N. J., (tank car plus .5 cent) 7.94 cents for "Dalco".

Newark, N. J., 30,255 gals. D. & L. Oil Sales Co., Newark, N. J., (tank car plus .5 cent) 7.94 cents for "Dalco".

Buffalo, 54,032 gals. Sinclair, (tank car plus .5 cent) 9 cents for "Sinclair H-C".

Rochester, N. Y., 19,851 gals. Sinclair (tank car plus .5 cent) 9 cents for "Sinclair H-C".

New York, 314,576 gals. Sinclair (tank car flat) 7.9 cents for "Sinclair H-C".

Brooklyn, 117,204 gals. Sinclair (tank car flat) 7.9 cents for "Sinclair H-C".

Flushing, N. Y., 15,000 gals. Sinclair (tank car flat) 7.9 cents for "Sinclair H-C".

Jamaica, N. Y., 8,674 gals. Sinclair (tank car flat) 7.9 cents for "Sinclair H-C".

Pittsburgh, 47,950 gals. Parmelee Motor Fuel Co., Pittsburgh, (tank car plus .25 cent) 8.75 cents for "Richfield".

Philadelphia, 185,500 gals. The Petrol Corp., Philadelphia, (tank car flat) 7.75 cents for "Petrol".

Providence, R. I., 15,200 gals. Texaco, (tank car plus .5 cent) 8 cents for "Fire Chief".

Birmingham, Ala., 13,220 gals. Standard of Kentucky (tank wagon minus 3 cents) 8.5 cents for "Crown".

Jacksonville, Fla., 10,350 gals. Standard of Kentucky (tank wagon minus 3 cents) 7.75 cents for "Crown".

Miami, Fla., 21,550 gals. Standard of Kentucky (tank wagon minus 3 cents) 7.75 cents for "Crown".

Atlanta, Ga., 12,886 gals. Standard of Kentucky (tank wagon minus 3 cents) 9.75 cents for "Crown".

Memphis, 23,761 gals. Texaco (tank car plus .5 cent) 9.5 cents for "Fire Chief".

Richmond, Va., 4,450 gals. Atlantic (tank car plus .5 cent) 9.3 cents for "White Flash".

Norfolk, Va., 19,310 gals. Texaco (tank car plus 1 cent) 9.5 cents for "Fire Chief".

Chicago, 247,431 gals. Sinclair (tank wagon minus 2 cents) 7.12 cents for "Sinclair H-C".

Indianapolis, 29,373 gals. Indian Refining Co., Indianapolis, (tank wagon minus 1.5 cents) 9 cents for "Fire Chief".

Des Moines, 10,000 gals. Sinclair, (tank wagon minus 1.5 cents) 8.5 cents for "Sinclair H-C".

Louisville, Ky., 14,550 gals. Superior Petroleum Co., Louisville, (tank wagon minus 1 cent) 9.9 cents for "Superior Bronze".

Grand Rapids, Mich., 9,065 gals. Sinclair, (tank wagon minus 1.5 cents) 9.45 cents for "Sinclair H-C".

Detroit, 145,260 gals. Sinclair, (tank wagon minus 1.5 cents) 8.45 cents for "Sinclair H-C".

Kansas City, Mo., 30,000 gals. Sinclair, (tank wagon minus 1.5 cents) 7.15 cents for "Sinclair H-C".

St. Louis, Mo., 60,500 gals. Deep Rock, (tank wagon minus 1.5 cents) 7.99 cents for "Super Kant Nock".

Toledo, 14,144 gals. Standard of Ohio, (tank wagon minus 1 cent) 9.5 cents for "Sohio X-70".

Cleveland, 45,561 gals. Standard of Ohio, (tank wagon minus 1 cent) 9.5 cents for "Sohio X-70".

Cincinnati, 37,408 gals. Powerful Petroleum Corp., Cincinnati, (tank wagon minus 2.875 cents) 9.125 cents for "Super Pepper".

Columbus, O., 21,251 gals. Standard of Ohio (tank wagon minus 1 cent) 8.5 cents for "Sohio X-70".

Minneapolis, 43,500 gals. Deep Rock (tank wagon minus 1.5 cents) 9.02 cents for "Super Kant Nock".

St. Paul, 25,300 gals. Deep Rock (tank wagon minus 1.5 cents) 9.02 cents for "Super Kant Nock".

Omaha, Nebr., 16,500 gals. Deep Rock (tank wagon minus 1.5 cents) 8.43 cents for "Super Kant Nock".

Milwaukee, 41,419 gals. Sinclair (tank wagon minus 1.5 cents) 8.15 cents for "Sinclair H-C".

Dallas, Tex., 24,748 gals. Sinclair (tank wagon flat) 8.3 cents for "Sinclair H-C".

San Antonio, Tex., 16,920 gals. Texaco (tank wagon flat) 9 cents for "Fire Chief".

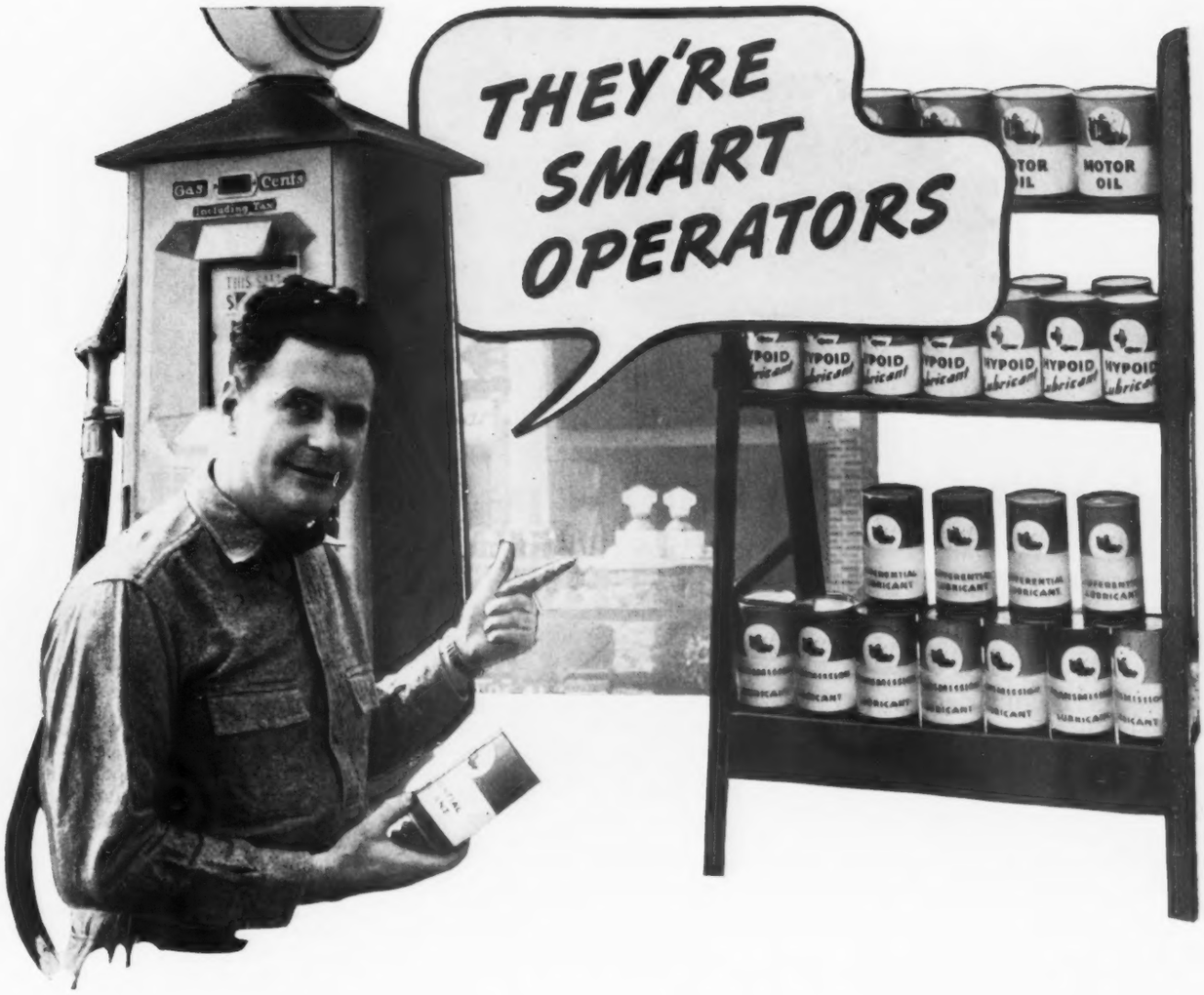
Denver, 17,500 gals. The Navy Gas & Supply Co. (tank wagon minus 2 cents) 9.6 cents for "Super Shell".

San Francisco, 148,555 gals. Texaco (tank wagon minus 3 cents) 10.5 cents for "Fire Chief".

Oakland, Calif., 64,020 gals. Texaco (tank wagon minus 3 cents) 10.5 cents for "Fire Chief".

Los Angeles, 500,233 gals. Petrol Corp., Los Angeles, (tank wagon minus .25 cent) 9.75 cents for "Super Petrol".

Seattle, Wash., 35,012 gals. Texaco (tank wagon less 3 cents) 11 cents for "Fire Chief".



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The Rapid Transit company, which is a contract carrier, transporting for various jobbers as well as the Kent company, operates ten tractor and trailer outfits.

Most of its shipments originate at the Potwin, Kans., refinery of Vickers Petroleum Co. Destinations are mainly in Kansas, although a considerable volume of gasoline is moved into Colorado, especially Denver.

The average distance from refinery to destination in Kansas is approximately 180 miles, or 360 for the round trip. The shortest haul is 80 miles, the longest 360.

On shipments to Denver the haul from refinery to destination is approximately 530 miles; or 1060 miles for the two-way trip.

Five of the trailer units operated by the company have 2500 gallons capacity; two have 3000 gallons capacity; and one each is of 3250, 3400 and 4400 gallons capacity.

The company uses one driver on each truck, and generally each man has assigned to him a particular truck. The company feels that it will secure greater efficiency from the driver where he alone is responsible for the condition of the equipment, and that he will take better care of it where he alone operates it. The company admits that they lose some miles on account of the fact the truck is not operated while the driver is laying over; but it feels there are factors which offset this loss of operation.

All drivers hired by the company must be mechanics and have a working knowledge of the truck they are operating. They must be able to make minor repairs while on the road. Each driver changes oil and greases the truck assigned to him, the only exception being wheel bearings, which are taken care of at the company's headquarters. However, some drivers prefer to grease their own wheel bearings.

All brake work is done by a specialist. The company does not permit any garage to adjust or repair brakes except in an emergency while the truck is on the road. The company feels it is more economical to keep the trucks in condition than to let them run down and require expensive overhaul jobs.

All drivers, regardless of previous experience, who come into the employ of the Rapid Transit company must make at least two student trips with two of its most reliable drivers. Reports are made by these drivers on the manner in which the prospective driver handles the unit. No driver is employed who has not previously driven a semi-trailer unit.

The Rapid Transit Co. has operated gasoline transport trucks since 1933 covering over 4,000,000 miles, without personal injury to any of its drivers or to the traveling public. During this period of operation the total cost for damage to trucks and other property has been only $175.

The most economical truck for this company's operations, it has found, is the 3000-gallon semi-trailer pulled by a 2-3 ton tractor. However, the company has found that many oil concerns regard a 2500-gallon trailer as a standard transport load and for that reason it is difficult to use units carrying larger loads to serve all jobbers. Furthermore, in many cases, the jobber wants 500 or 1000 gallons of kerosine along with gasoline and it is necessary to have double bulkheads for the transport tank where gasoline and kerosine are handled in the same unit, in order to avoid any possibility of mixing of products due to a leak between compartments of the tank.

All trucks are equipped with recorders, which are placed in the cabs of the trucks. They operate with a 72-hour clock, recording the operation of the truck from the time the dial is placed in the recorder until it is removed, or for a 72-hour period. The recorder shows the time the truck is moving, the idle time, whether the engine in the truck is running when the unit is not moving and any vibration during the time the unit is stopping. The company reports that the recorders have resulted in a considerable saving of otherwise lost time.

The trucks are equipped with power take off and transfer pumps. Some of the bulk plants to which petroleum products are transported are not equipped to unload through their regular pumps from transport tanks. Other plants are so situated that they do not use pumps for loading tank wagons from bulk storage and it is necessary to have other means of unloading the transport trucks.

New House Organ for Dealers

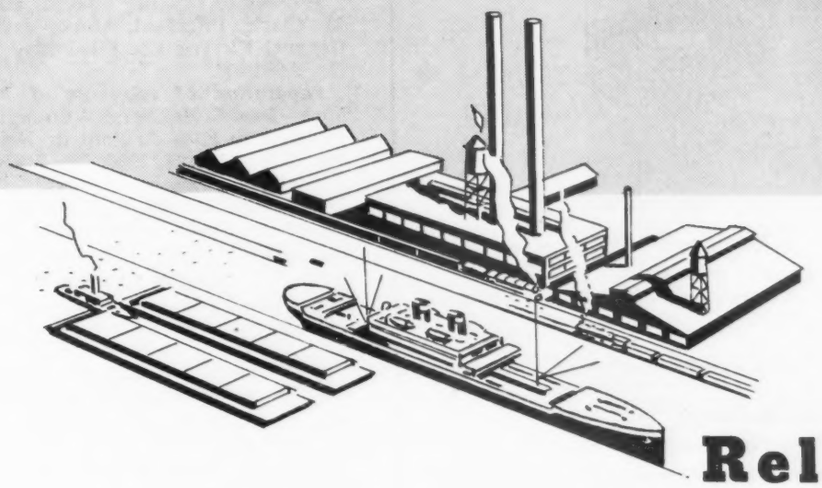
NEW YORK, Oct. 1.—A house organ that puts across its merchandising hints to dealers almost entirely in pictures has been launched by the Socony-Vacuum Oil Co., Inc., to circulate among its 60,000 dealers in the U. S.

This new monthly is called "The Flying Red Horse", in keeping with the company's emblem. It is 11 by 14 inches, the first issue containing 20 pages and nearly 100 photographs.

Such lively examples of merchandising as are contained in the picture drama "How the End of the Jones Family Vacation Can Mean the Start of Extra Profits For You", and, "Service Crime: Mystery of a Lost Sale" are typical of the manner in which sales ideas will be suggested.

An idea of the company's far flung operations can be gained from the pictures captioned "The Sun Never Sets on the Mobiloil Sign", including shots from China, Manila and Hungary.

For Increased Working Capital at Low Cost



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POSITION_____ COMPANY_____

NEW PATENTS

Compiled by R. E. Burnham, patent and trademark attorney, 511 Eleventh Street, N. W., Washington, D. C., from whom copies may be obtained at the rate of 25c each. State number of patent and name of inventor when ordering.

July 27, 1937

REFINING

Method of breaking emulsions—Abraham M. Herbsman, Huntington Park, Calif., assignor to Industrial Patents, Ltd., Los Angeles, Calif. Filed Feb. 24, 1936. No. 2,087,936.

Process of hydrogenating carbonaceous materials—Theodor W. Pfirrmann, Germany. Filed March 19, 1934. No. 2,088,214.

Process of refining a hydrocarbon oil—Edmond R. P. E. Retailliau, Wood River, Ill., assignor to Shell Development Co. Filed May 13, 1935. No. 2,088,216.

Process of refining mineral oil—Frank M. Clark, Pittsfield, Mass., assignor to General Electric Co. Filed May 19, 1934. No. 2,088,406.

Separation of mixtures of hydrocarbons—Paul L. Salzberg, Wilmington, Del., assignor to E. I. du Pont de Nemours & Co., Filed May 21, 1936. No. 2,088,441.

Acetylenization of mineral oils—Hein I. Waterman, Delft, Netherlands, assignor to Shell Development Co. Filed April 20, 1935. No. 2,088,500.

MISCELLANEOUS

Motor fuel composition—Will R. Savage, Omaha, Neb. Filed July 31, 1934. No. 2,088,000.

Method for recovery of alcohols—William Engs and Richard Moravee, Berkeley, Calif., assignors to Shell Development Co. Filed June 9, 1931. No. 2,008,083.

Lubricant and method of producing same—William L. Evers, Woodbury, N. J., assignor to Socony-Vacuum Oil Co. Filed Feb. 27, 1935. No. 2,088,193.

High temperature lubricant and process of preparation—Irving R. Valentine, Erie, Pa., assignor to General Electric Co. Filed July 10, 1935. No. 2,088,452.

* * *

August 3, 1937

REFINING

Process for manufacture of lubricating oils—John E. Schulze, Chicago, Ill., assignor to Red River Refining Co. Filed May 5, 1932. No. 2,088,616.

Vapor purification and cracking method and apparatus for petroleum oils—Ernest A. Ocon, New York, N. Y. Filed June 15, 1935. No. 2,088,756.

Cracking hydrocarbon oils—Howard Dimmig, New York, N. Y., assignor to Gasoline Products Co. Filed Sept. 8, 1934. No. 2,088,778.

Conversion of hydrocarbon oils—Charles H. Angell, Chicago, Ill., assignor to Universal Oil Products Co. Filed June 27, 1934. No. 2,088,987.

Apparatus for separating wax from oil—Leo D. Jones, Philadelphia, Pa., assignor to Sharples Specialty Co. Filed Nov. 3, 1934. No. 2,089,122.

The following to Pure Oil Co., as assignee of the inventor, Cary D. Wagner, Chicago, Ill.:

Polymerization of unsaturated hydro-

carbon—Filed Oct. 10, 1932. No. 2,088,823.

Polymerization of hydrocarbon gases—Filed April 11, 1929. No. 2,088,824.

Polymerization of hydrocarbon gases—Filed Nov. 5, 1931. No. 2,088,886.

Method of treating cracked hydrocarbon gases—Filed Feb. 29, 1932. No. 2,088,887.

MISCELLANEOUS

Mixing device—Albert J. Ferkel, Brunswick, Ga., assignor to Atlantic Refining Co. Filed Dec. 27, 1835. No. 2,088,591.

Manufacture of alkylated cyclic hydrocarbons—Vladimir Ipatieff and Aristad V. Grosse, Chicago, Ill., assignors to Universal Oil Products Co. Filed March 7, 1935. No. 2,088,598.

Lubricating oil—Ferdinand W. Breth, Petrolia, Pa., assignor to Standard Oil Development Co. Filed Oct. 2, 1934. No. 2,088,898.

Anti-knock gasoline — Nicolaas Max, Amsterdam, Netherlands, assignor to Shell Development Co. Filed April 13, 1936. No. 2,088,997.

Qualitative analysis of oils—Robert E. Burk, Cleveland, Ohio, assignor to Standard Oil Co. (Ohio). Filed Oct. 9, 1934. No. 2,089,017.

Catalytic converter—Ewald D. Pyzel, Pittsburgh, Calif., assignor to Shell Development Co. Filed Jan. 27, 1936. No. 2,089,038.

Oil Burner Shipments At Increased Level

WASHINGTON, Oct. 4.—Shipments of distillate oil burners by American manufacturers in August numbered 55,071, compared with 49,847 in the same month last year and 23,935 in August, 1935.

A similar increase is shown in shipments of oil burners and oil burner units consuming No. 1 commercial standard grade or heavier, used in homes, apartments, office buildings, churches, etc. August shipments of these burners totaled 22,413, compared with 21,164 in August, 1936, and 15,549 in the same month of 1935.

Even more sharp is the increase shown for shipments during the months of the current year.

Distillate oil burners shipped through August this year numbered 199,216, compared with 155,062 in 1936 and 65,832 in 1935. The 1937 figure for shipments of oil burners of the other type is 116,159 for the first eight months; shipments were 99,866 for eight months of 1936 and those for the same period in 1935 were 68,321.

Rate Cut on Michigan Crude to Canton, O.

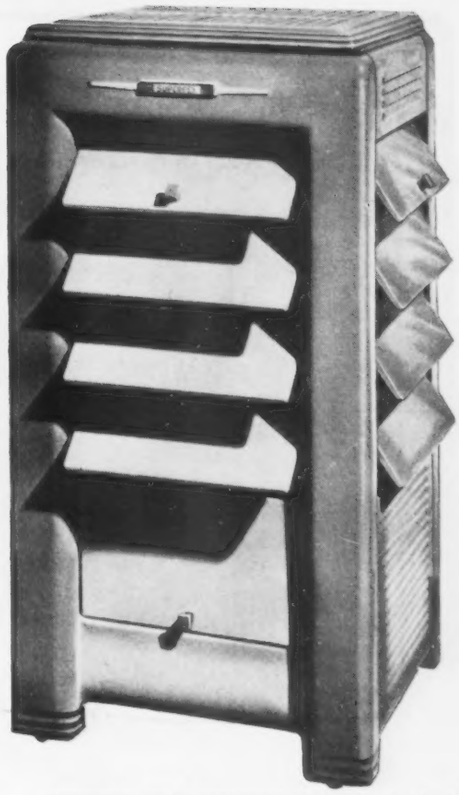
WASHINGTON, Oct. 4. — Reduced freight rates on crude petroleum from Gladwin, Mich., to Canton, O., sought in a recent application filed with the Interstate Commerce Commission have been granted and are now in effect.

The rails sought to publish the new rates on one-day's notice but were granted authority to publish them on five days' notice. Pipeline competition was cited by the roads as the reason for the application.

The new rates are 13 cents per 100 pounds, in lieu of the 25 cents the rails have been charging under class rates.

In every respect...

THE MOST SATISFACTORY heating service FOR YOUR STATIONS



SUPERFEX HEAT-DIRECTOR No. 1035, finished in two-tone brown porcelain enamel. One of several sizes offering a range of heating capacities for every stove-heating need.

● **SUPERFEX** *Oil Burning Heat-Directors combine Circulating, Radiating and "Directed" heat . . .*

MOST SATISFACTORY FOR YOUR BUSINESS SUPERFEX Heaters promote the sale of fuel oils. Every service station heated by SUPERFEX is a permanent demonstration of modern oil heating. Why not use and boost the fuel you sell?

MOST SATISFACTORY FOR THE STATION HEATING JOB SUPERFEX Heaters give ample heat volume with finger tip control. Stations are warm when opened up, no matter what the hour, no matter how severe the weather. With SUPERFEX heat, frozen water pipes are a thing of the past.

SUPERFEX RADIATING HEATER No. 1109, finished in brown porcelain enamel. Made in several sizes for use where straight radiating heat is satisfactory.

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The combination of circulating, radiating and directed heat gives complete flexibility and protects the health of station attendants, saving lost time. Shutters on three sides of the SUPERFEX Heat-Director may be opened to throw radiant heat out into the room or downward at any desired angle to warm the floor. With shutters closed, heat circulates.

The new SUPERFEX is especially designed to burn any one of a wide variety of fuel oils. The fuel reservoir is easily removable. Connections for use with outside fuel storage are also available. Send for complete information.

SUPERFEX *OIL BURNING HEATERS*

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PERFECTION STOVE COMPANY, *7883-C Platt Avenue, Cleveland, Ohio*
Please send me complete information about:
☐ SUPERFEX HEAT-DIRECTORS and RADIATING HEATERS
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MORRISON *Loading* VALVE

Works perfectly on gravity, high or low pressure. Eliminates line hammers and destructive pounding against pump and by-pass valve. Sizes of 2", 2½", 3" and 4". Flanged or threaded ends. Built for accurate operation, sure safety and station economy.

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Oil Equipment Headquarters

DUBUQUE, IOWA

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Automatic barrel fillers are management's tirelessly accurate representatives at the bulk packaging of all liquid products. By making sure that containers *are* properly filled, they keep customers contented. By guarding against overflow, not only do they prevent waste . . . outsides of containers are kept clean and attractive.

Any liquid (hot or cold) that will not attack metal, can be handled by Penflex Automatic Barrel Fillers. Filling level is readily regulated to suit shape of barrel, drum or can.

PENFLEX Bul. 54

Fully illustrates the simple parts and trouble-free operation. Get it.

Pennsylvania Flexible Metallic Tubing Co.
7231 Powers Lane, Philadelphia, Pa.

In Selecting a Source of Supply . . .

for your lubricating oil requirements covering the year 1938, it is necessary to bear in mind the following dominant factors:

Reliability of supplier
Experience in meeting individual specifications
Desire to co-operate with purchaser

This company comes under all the requisites listed above. Our four refineries and seaboard barrelling plant offer their modern facilities to take care of your individual needs. We specialize in both winter and summer oils as well as bright stock, neutrals, and high flash steam refined stocks.

JAMES B. BERRY SONS' CO., INC. OIL CITY, PA.

Branch Offices: New York City; Chicago, Ill.; Boston, Mass.; Philadelphia, Pa.; Houston, Texas; London, England; Hamburg, Germany; The Hague, Holland.

Refineries: Oil City, Pa.; Emlenton, Pa.; Farmer's Valley, Pa.; St. Mary's, W. Va.
Ocean Terminals: Baltimore, Md.; Tiverton, R. I.; Dorchester, Mass.; Carteret, N. J.; Edgewater, N. J.; Glastonbury, Conn.; Philadelphia, Pa.

New La. Refinery

CLEVELAND, Oct. 4.—Octane Oil & Refining Co., Longview, Texas, now has under construction at Cotton Valley, La., a refinery which will have a capacity of 3000 barrels a day, it is announced.

Work was started in September after Sylvester Dayson, president of the company, signed one of the contracts sponsored as part of Governor Leche's industrial expansion program for Louisiana, granting a ten-year tax exempt period. Cost of the plant will be over $500,000 initially but the company's investment may be increased by $2,500,000 within a year, according to Dayson.

National Petroleum News Ownership Statement

Statement of the ownership, management, circulation, etc., required by the Act of Congress of August 24, 1912, and March 3, 1933, of National Petroleum News, published weekly at Cleveland, Ohio, for October 1, 1937, State of Ohio, County of Cuyahoga.

Before me, a notary public in and for the State and County aforesaid, personally appeared A. E. Kraft, who, having been duly sworn according to law, deposes and says that she is the business manager of the National Petroleum News and that the following is, to the best of her knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption required by the Act of August 24, 1912, as amended by the Act of March 3, 1933, embodied in section 537, Postal Laws and Regulations, printed on the reverse of this form, to-wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are: Publisher, The National Petroleum Publishing Company, Cleveland, Ohio; editor, Warren C. Platt, Cleveland, Ohio; managing editor, V. B. Guthrie, Cleveland, Ohio; and business managers are: A. E. Kraft, Cleveland, Ohio.

2. That the owners are: The National Petroleum Publishing Co., Cleveland, Ohio; Warren C. Platt, Cleveland, Ohio; Bess H. Platt, Cleveland, Ohio; A. W. Brobst, Cleveland, Ohio; Margaret H. Fretter and Margaret Fretter Nye, Cleveland, Ohio.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of the total amount of bonds, mortgages, other securities are None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company, but also, in cases where the stockholder or security holders appear upon the books of the company as trustees or in any other fiduciary relation, the names of the person or corporation for whom each trustee is acting, is given; also that the said two paragrapns contain statements embracing affiants' full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds or other securities than as so stated by her.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise to paid subscribers during the six months preceding the date shown above is (This information is required from daily publications only.)

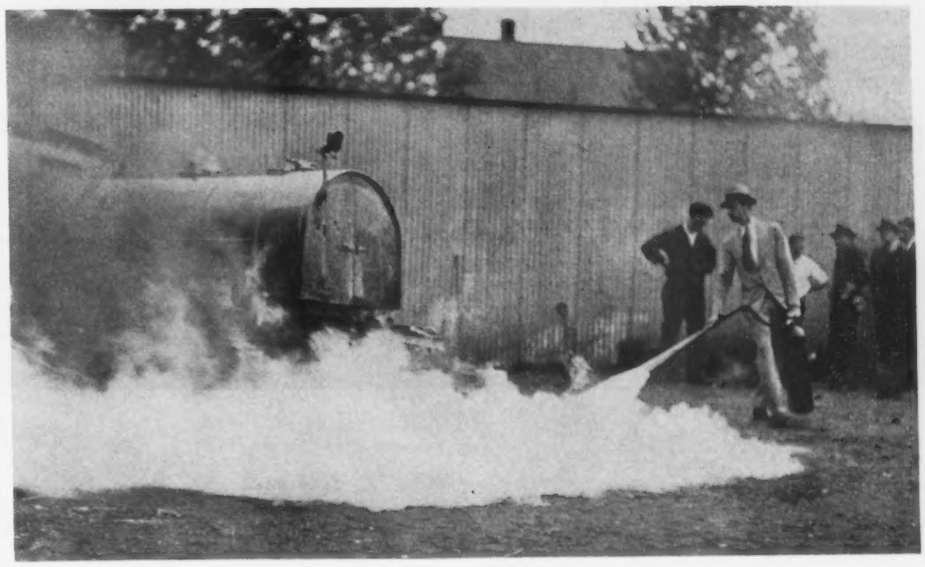
(Signed) A. E. KRAFT,
Business Manager.

Sworn to and subscribed before me this 1st day of October, 1937.

(Signed) H. L. RICHEY,
Notary Public.

(My commission expires May 7, 1939.)

21 seconds to kill this truck fire!



Actual proving-grounds test

YOU'VE got to get the jump on fire. Snuff it out *fast!* Use the fastest known extinguishing agent—LUX carbon-dioxide snow-and-gas.

Lux extinguishers will handle the meanest blazes with astonishing ease. Truck fires, spill fires, running-gasoline fires—your Lux extinguishers will kill them in a few swift seconds.

Remember, too, that Lux does no damage—harms neither men nor materials. Lux is so clean and dry that it eliminates all "extinguisher mess". Thus you need not shut down machinery for clean-ups. If the fire has done no damage you can keep the plant moving right along.

Write for complete fire protection file.

Walter Kidde & Company

36 West Street **Bloomfield, N. J.**

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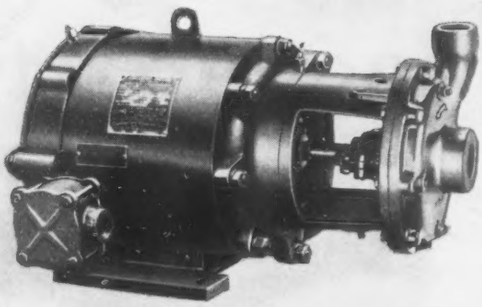
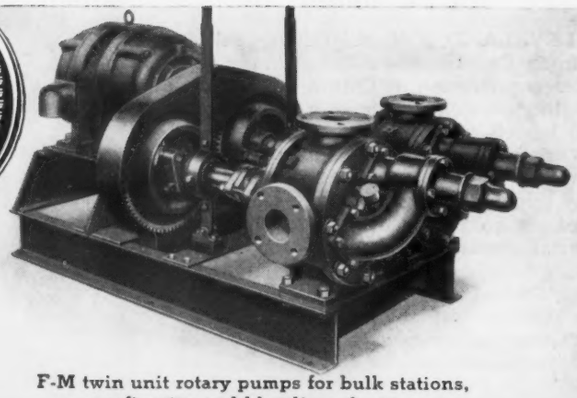


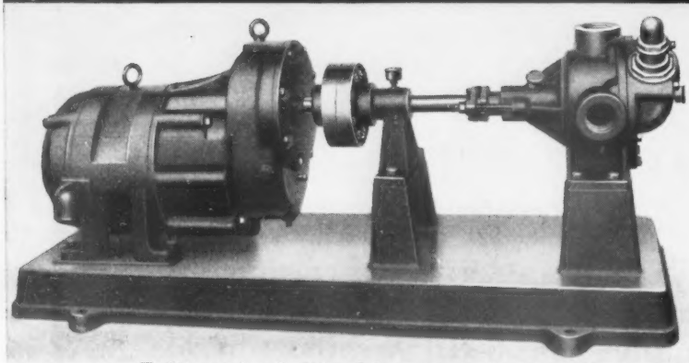
F-M built-together motor-pump units with explosion-proof motors



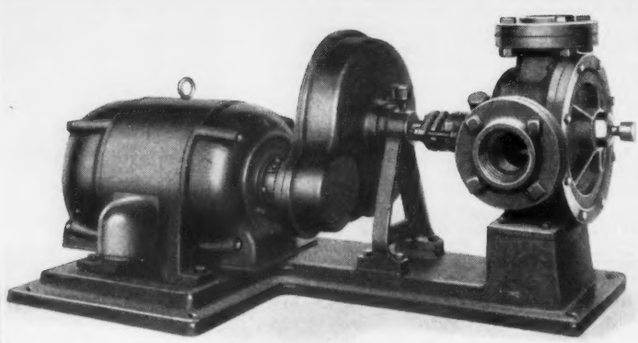
F-M twin unit rotary pumps for bulk stations, refineries and blending plants

How to choose a pump

FOR PETROLEUM SERVICE



F- M gear head motor-driven rotary pump



F-M gear-driven rotary pump

● Choose on four points. The pump itself. Its service record in similar service. The manufacturer and his reputation. The extent to which a manufacturer's recommendation is influenced by the type and size of pumps he happens to make.

To take the last point first. Fairbanks-Morse men are entirely free from bias toward any one type when they specify a given F-M pump for a job. For they have a complete line of pumps in many types and ratings from which to choose, and their recommendations are never handicapped by the mere desire to land an order. They can give you the right pump for the job, and without compromises that might affect efficiency.

We invite every user of petroleum-handling equipment to study the many Fairbanks-Morse pumps especially developed for this service . . . to examine their service records in typical installations . . . to learn of their manufacture and the unequalled service facilities that stand behind them.

For your copy of Bulletin M-59, address Fairbanks, Morse & Co., 900 S. Wabash Ave., Chicago, Ill. 34 branches at your service throughout the United States.

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Pumps

Markets

At A Glance . . .

Mid-Continent: Natural gasoline prices advance.

Pennsylvania: Cylinder stocks sold at lower prices.

Mid-Western: Straight-run Michigan gasoline soft.

Eastern Seaboard: New York gasoline down.

Gulf Coast: Low octane gasolines cheaper.

Wax: Crude scale firm as demand increases.

California: Japanese buying active.

Mid-Continent

Natural Gasoline Prices Higher

N. P. N. News Bureau

TULSA, Oct. 4. — Active demand last week for Grade 26-70 natural gasoline, f.o.b. Breckenridge basis, sent prices up 0.125 cent to 4.625 cents. Orders for approximately 400 tank cars were placed in an animated trading period of less than 48 hours duration. Purchases covered gasoline originating in Oklahoma and Texas, although shipment was to the Gulf coast. Buying for southern shipment disturbed the parity between Grade 26-70 prices f.o.b. Breckenridge and Group 3.

Definite unsteadiness in Mid-Continent refined gasoline prices was reported by several refiners. Gasoline supplies, according to reports, exceeded by far the amount of business placed by jobbers both under contract and in the open market. As a result gasoline stocks were piling up at many refineries. Refiners were considering curtailment of refinery operations to forestall price reductions. As the week closed, quotations to jobbers generally were unchanged, although unconfirmed reports of price shading were encountered.

Buyers seeking Mid-Continent wax reported most suppliers were sold out. Prices, however, were unchanged. Lubricating oil markets last week showed little reaction to the one-cent price reduction made the previous week.

Kerosine orders were good as demand from agricultural and range oil users continued active.

Pennsylvania

Cylinder Stocks Down 1 Cent

N. P. N. News Bureau

CLEVELAND, Oct. 4. — Firm demand for light end products and slight demand for the heavy ends continued to characterize the Pennsylvania market last week, with the result that kerosine, gasoline and fuel oil were scarce, but inventories continued to accumulate on heavier stocks. Part of these inventories, however, represented seasonal accumulations of blenders.

All cylinder stocks were offered at prices 1 cent per gallon less. While some traders reported an improved outlook on neutral oils, others said that demand had been slight and some shading of prices was evident. Refiners generally were holding firm on prices of neutral oils in expectation of the seasonal increase in demand.

Bright stocks were fairly quiet, although a pick-up in sales was noticeable.

U. S. motor gasoline was sold one-quarter cent less in the lower field, largely to meet competition of Michigan gasoline at eastern Ohio points, according to traders.

Mid-Western

Michigan Gasoline Prices Soft

CHICAGO, Oct. 4. — For the fourth successive week the Mid-Western gasoline market was without special feature and tended toward lower prices, although actual changes were lacking last week.

Offerings of all grades were free throughout the period. While occasional low-priced offerings of low, middle and high octane gasoline were heard Oct. 1 and 2, these were scattered, and general prices were unchanged.

Good weather over much of the middle west aided consumption, and open market demand picked up somewhat toward the close of the week.

A steady volume of gasoline moved against contracts.

Quoting on the L-3 octane method by Chicago sellers has been delayed because sources of supply have been slow in reporting octane values under the new method. However, as the week ended, many sellers here quoted gasoline with the octane value determined both by the C. F. R. and the L-3 method, and indicated that the former would be dropped as buyers gradually swung over to the L-3 method.

Straight-run gasoline continued relatively soft in the Central Michigan refinery market. Sales for shipment outside the state were 0.375 to 0.5c under the in-state price of 5.375c.

Kerosine was tight both in the Mid-Western and Michigan markets. Some Chicago sellers asked higher prices for this product last week. Michigan refiners reported a good demand and a stiffening of prices.

Pa. Refinery Lubricating Oil Inventory

(Issued as of Sept. 23 by National Petroleum Assoc.)

	Gallons
1. **Raw Long Residuum** (Including all raw long residuum below, and not salable, as 600 fire)	1,272,196
2. **600 Steam Refined** (Includes all steam refined stock commonly sold or used as 600 and as raw material for bright stocks)	11,430,229
3. **Other Steam Refined** (Not included in 1 and 2 above)	3,280,511
4. **Finished Dewaxed Long Res.**	2,840,068
5. **Bright Stock** (Does not include any material reported in 4, above)	14,230,830
6. **Viscous Neutral,** below 180 vis. but not below 142 vis. @ 100	7,665,956
7. **Viscous Neutral,** 180 vis. @ 100 and above	8,241,583

Eastern

New York Gasoline Down

N. P. N. News Bureau

NEW YORK, Oct. 4. — An easier tone prevailed in some eastern gasoline markets during the past week, particularly at New York harbor, where barge prices were reduced 0.25 cent by some suppliers. No general changes were reported in wholesale markets along the seaboard, however.

Some sales of above 65 octane gasoline for barge movement from New York harbor were reported at 7.25 cents early the past week, compared to minimum quotations of 7.50 cents the previous week. Open market demand generally was reported light. One jobber, who had been in the market for gasoline for barge shipment up the New York canal, reported he had decided to hold buying until later as he failed to receive quotations at the level he was willing to pay.

Shipments against contracts from eastern terminals were reported satisfactory by suppliers. Service station markets in metropolitan New York were steady, with most stations reported selling branded grades at five gallons for 98 cents, including taxes. Markets in New Jersey were reported still unsettled.

Demand for kerosine was reported steady at unchanged prices for wholesale movement. Retail markets were reported disturbed at many points.

Coastal

Cargo Markets Quiet

N. P. N. News Bureau

NEW YORK, Oct. 4. — Cargo markets were quiet at the Gulf Coast the past week, traders reported, and no open market cargo sales were confirmed.

Some cargo inquiries were reported in the market, but the inquirers apparently were not very anxious to buy. Traders said that the lack of open market sales of kerosine and light fuel oils came more

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). Prices in cents per gallon, except heavy fuel oils in dollars per barrel, tank car lots, f.o.b. refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included, unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude.

Gasoline *and* Naphtha

Prices Effective	Oct. 4	Sept. 27
OKLAHOMA		
U. S. Motor: (a) (Octane Test L-3)		
62 oct. & below	5.00 – 5.125	5.00 – 5.125
63-66 oct.	5.375– 5.50	5.375– 5.50
67-69 oct.	5.625– 5.875	5.625– 5.875
70-72 oct.	6.00 – 6.125	6.00 – 6.125
60-62, 400 e.p.	5.00 – 5.25	5.00 – 5.25
64-66, 375 e.p.	*5.125– 5.25	*5.125– 5.25
68-70, 350-360 e.p.	*5.125– 5.375	*5.125– 5.375
WESTERN PENNA.		
Bradford-Warren:		
52-54 naphtha	*6.00 – 6.125	*6.00 – 6.125
Motor gasoline:		
U. S. Motor (58-62°)	6.00 – 6.25	6.00 – 6.25
Min. 60 oct.	*7.50 – 7.75	*7.50 – 7.75
Min. 65 oct.	*7.75 – 8.00	*7.75 – 8.00
64-66, 390 e.p.	6.125– 6.25	6.125– 6.25
68-70, 350-360 e.p.	6.25 – 6.375	6.25 – 6.375
Other districts:		
52-54 naphtha	*5.625– 5.75	*5.625– 5.75
54-56 naphtha	5.75 – 5.875	5.75 – 5.875
Motor gasoline:		
U. S. Motor (58-62°)	5.75 – 5.875	5.75 – 5.875
Min. 60 oct.	7.375– 7.75	7.375– 7.75
Min. 65 oct.	7.50 – 8.00	7.50 – 8.00
64-66, 390 e.p.	5.75 – 5.875	5.75 – 5.875
68-70, 350-360 e.p.	6.00 – 6.125	6.00 – 6.125
CENTRAL MICHIGAN (Prices f.o.b. Cent. Mich. refinery group basis. Shipments, however, may originate at plants outside Central group).		
Str.-Run Gasoline	5.25 – 5.75	5.375– 5.75
64-66 octane gas.	7.75 – 8.00	7.75 – 8.00
68-70 octane gas	8.25 – 8.50	8.25 – 8.50
CALIFORNIA (3c tax to be added to prices if used in state)		
U. S. Motor:		
54-58, for instate shipment	7.50 – 9.25	7.50 – 9.25
54-58, for outside state shipment	8.25 – 9.00	8.25 – 9.00
58-61, 375-400 e.p., 65 oct. & above	8.50 – 9.75	8.50 – 9.75
†N. TEX. (For shipment to Texas and N. Mex. destinations; Group 3 prices quoted on northern shipments).		
U. S. Motor: (a) (Octane Test L-3)		
62 oct. & below	5.00 – 5.25	5.00 – 5.25
63-66 oct.	5.50	.....
67-69 oct.	5.75	.....
70-72 oct.	6.00	.....
60-62, 400 e.p.	*5.125– 5.25	*5.125– 5.25
KANSAS (For Kansas destinations only)		
U. S. Motor: (a) (Octane Test L-3)		
62 oct. & below	5.25 – 5.375	5.25 – 5.375
63-66 oct.	5.625– 5.75	5.625– 5.75
67-69 oct.	5.875– 6.00	5.875– 6.00
70-72 oct.	6.25 – 6.375	6.25 – 6.375
†W. TEX. & N. MEX.		
U. S. Motor: (a) (Octane Test L-3)		
62 oct. & below	5.00 – 5.125	5.00 – 5.125
63-66 oct.	5.375– 5.50	.....
67-69 oct.	5.625– 5.875	.....
70-72 oct.	6.00 – 6.125	.....
†E. TEX.		
60-62, 400 e.p.	*5.00	*5.00
N. LA. (For shipment within La. & into Ark.)		
U. S. Motor: (a) (Octane Test L-3)		
62 oct. & below	5.375– 5.50	5.50
63-66 oct.	5.50 – 5.625	.....
67-69 oct.	5.75 – 5.875	.....
70-72 oct.	6.375– 6.50	.....
ARKANSAS (For shipment within Ark. & into La.)		
U. S. Motor:		
62 octane & below	‡5.50	‡5.50
63-67 oct.	‡6.00	‡6.00
OHIO (Quotations of S. O. Ohio. Delivered anywhere in Ohio).		
U. S. Motor	8.75	8.75
Above 65 oct.	9.00	9.00

Natural Gasoline

(Prices are those to blenders on freight basis shown below. Shipments, however, may originate in other Mid-Continent manufacturing districts, such as Panhandle Texas, S. W. Texas or Kans.)

Prices Effective	Oct. 4	Sept. 27
F.O.B. GROUP 3		
Grade 26-70	4.50	4.50

*Nominal.

‡Only one refiner quoting.

†Refiners report they generally receive from 0.25c to 0.5c per gal. more for gasoline & kerosine for local or differential territory shipment.

(a) In line with National Petroleum News' policy of reflecting general trade practice, the above revisions in octane brackets, determined according to L-3 method, for U. S. Motor gasoline, have been made in the Okla. and Kans. markets, effective Sept. 20, 1937; in North and West Texas and North Louisiana, Oct. 4. Formerly, octane numbers were: 62 & below, 63-67, and 68-70.

Prices Effective	Oct. 4	Sept. 27
Natural Gasoline (Cont'd)		
F.O.B. BRECKENRIDGE		
Grade 26-70	4.625	4.50
CALIFORNIA (F.o.b. plants in Los Angeles basin)		
75-85, 350-375 e.p. for blending	7.25 – 7.50	7.25 – 7.50

Kerosine

WESTERN PENNA.		
Bradford-Warren:		
45 w.w.	5.375– 5.50	5.25 – 5.375
46 w.w.	5.50 – 5.625	5.375– 5.50
47 w.w.	5.625– 5.75	5.50 – 5.625
Other districts:		
45 w.w.	5.375– 5.50	5.25 – 5.375
46 w.w.	5.50 – 5.625	5.375– 5.50
47 w.w.	5.625– 5.75	5.50 – 5.625
CENTRAL MICHIGAN (Prices f.o.b. Cent. Mich. refinery group basis. Shipments, however, may originate at plants outside Central group).		
47-49 w.w.	5.00 – 5.30	5.00 – 5.30
OKLAHOMA		
41-43	4.00 – 4.25	4.00 – 4.25
42-44 w.w.	4.25 – 4.375	4.25 – 4.375
KANSAS (For Kansas destinations only).		
41-43 w.w.	4.375– 4.50	4.375– 4.50
42-44 w.w.	4.50 – 4.625	4.50 – 4.625
†N. TEX. (For shipment to Texas and New Mexico destinations; Group 3 prices quoted on northern shipments).		
41-43 w.w.	4.25 – 4.375	4.25 – 4.375
†E. TEX.		
41-43 w.w.	*4.00 – 4.125	*4.00 – 4.125
N. LA. (For shipment within La. and into Ark.).		
41-43 w.w.	4.50	4.50
ARK. (For shipment within Ark. and into La.).		
41-43 w.w.	‡4.75	‡4.75
CALIFORNIA		
40-43 w.w.	5.00 – 6.50	5.00 – 6.50

Gas *and* Fuel Oils

WESTERN PENNA.		
Bradford-Warren:		
36-40	4.75 – 4.875	4.75 – 4.875
Other districts: (Excluding Pittsburgh District Prices).		
36-40	4.50 – 4.625	4.50 – 4.625
CENTRAL MICHIGAN (Prices f.o.b. Cent. Mich. refinery group basis. Shipments, however, may originate at plants outside Central group).		
P.W. Distillate	4.50 – 5.00	4.50 – 5.00
No. 3 gas oil, str.	4.375– 4.625	4.375– 4.625
U.G.I. gas oil	4.25 – 4.40	4.25 – 4.40
Fuel Oils (Vis. at 100):		
500-700 Vis.	3.375– 3.625	3.375– 3.625
300-500 Vis.	3.50 – 4.00	3.50 – 4.00
100-300 Vis.	3.50 – 4.25	3.50 – 4.25
OKLAHOMA		
No. 1 white	4.00 – 4.125	4.00 – 4.125
No. 1 straw	3.75 – 4.00	3.75 – 3.875
No. 2 straw	3.625– 3.875	3.625– 3.875
No. 2 dark	3.50 – 3.625	3.50 – 3.625
U. G. I. gas oil	*3.375	3.125– 3.375
28-30 zero	*3.50 – 3.625	*3.375– 3.50
28-30	‡$1.35	‡$1.35
24-26	‡$0.925	‡$0.925
18-22	*$0.825–$0.90	*$0.825–$0.90
14-16	*$0.80 –$0.85	*$0.80 –$0.85
KANSAS (For Kans. destinations only).		
No. 1 p.w. fuel oil	4.125– 4.25	4.125– 4.25
10-14 fuel oil	$0.725–$0.775	$0.725–$0.775
N. TEX. (For shipment to Texas and N. Mex.; Group 3 prices quoted on northern shipments).		
No. 1 white	*4.00 – 4.125	*4.00 – 4.125
U. G. I. gas oil	2.875	2.875
24-26	$0.85 –$0.875	$0.85 –$0.875
18-22	$0.80 –$0.825	$0.80 –$0.825
N. LA. (For shipment within La. and into Ark.).		
No. 2	3.50 – 3.625	3.50 – 3.625
20-24	$1.10 –$1.15	$1.10 –$1.15
16-20	$0.95 –$1.00	$0.95 –$1.00
10-14	$0.80 –$0.85	$0.80 –$0.85
ARK. (For shipment within Ark. and into La.).		
No. 2	‡3.75	‡3.75
28-30 gas oil, zero	‡3.50	‡3.50
CALIFORNIA		
San Joaquin Valley:		
Heavy fuel	$0.65 –$1.00	$0.65 –$1.00
Light fuel	$0.85 –$1.10	$0.85 –$1.10
Diesel fuel (per gal.)	4.00 – 5.00	3.75 – 5.00
Stove dist. (per gal.)	4.50 – 7.00	4.50 – 7.00
Los Angeles:		
Heavy fuel	$0.60 –$1.10	$0.60 –$1.10
Light fuel	$0.90 –$1.20	$0.90 –$1.20
Diesel fuel (per gal.)	3.75 – 5.00	3.75 – 5.00
Stove dist. (per gal.)	4.25 – 7.00	4.25 – 7.00

Prices Effective	Oct. 4	Sept. 27
Gas and Fuel Oils (Cont'd)		
San Francisco:		
Heavy fuel	$1.15	$1.15
Light fuel	$1.25	$1.25
Diesel fuel (per gal.)	5.50	5.50
Stove dist. (per gal.)	7.50	7.50

Note: All above heavy fuels meet Pacific specification 400; light fuel, spec. 300; Diesel fuels, spec. 200; and stove distillate, spec. 100.

Neutral Oils

WESTERN PENNA.

Viscous Neutrals (Viscosity at 70° F.)

200 Vis. (180 at 100°) No. 3 col., 420-425 fl.:		
0 p.t.	27.00 –27.50	27.00 –27.50
10 p.t.	26.00 –26.50	26.00 –26.50
15 p.t.	25.50 –26.00	25.50 –26.00
25 p.t.	24.50 –25.00	24.50 –25.00
180 Vis. (165 at 100) No. 3 col., 410-415 fl.:		
25 p.t.	23.00 –23.50	23.00 –23.50
150 Vis. (143 at 100) No. 3 col., 400-405 fl.:		
0 p.t.	22.50 –23.00	22.50 –23.00
10 p.t.	21.50 –22.00	21.50 –22.00
15 p.t.	21.00 –21.50	21.00 –21.50
25 p.t.	20.00 –20.50	20.00 –20.50

SOUTH TEXAS

Vis.	Color		
Pale Oils: (*Vis. at 100° F.; p.t. 0*)			
100	No. 1½-2½	5.25 – 5.50	5.25 – 5.50
200	No. 2-3	7.25 – 7.50	7.25 – 7.50
300	No. 2-3	7.75 – 8.00	7.75 – 8.00
500	No. 2½-3½	8.75 – 9.00	8.75 – 9.00
750	No. 3-4	9.25 – 9.50	9.25 – 9.50
1200	No. 3-4	9.75 –10.00	9.75 –10.00
2000	No. 4	10.00 –10.25	10.00 –10.25
Red Oils:			
200	No. 5-6	7.25 – 7.50	7.25 – 7.50
300	No. 5-6	7.75 – 8.00	7.75 – 8.00
500	No. 5-6	8.75 – 9.00	8.75 – 9.00
750	No. 5-6	9.25 – 9.50	9.25 – 9.50
1200	No. 5-6	9.75 –10.00	9.75 –10.00
2000	No. 5-6	10.00 –10.25	10.00 –10.25

Note: South Texas red oil prices shown above cover oils with green cast; blue cast red oils are slightly lower in some cases.

MID-CONTINENT (Vis. at 100° F.; F.o.b. Tulsa basis).

(0 to 10 P.P.)

Vis.	Color		
Pale Oils:			
60-85	No. 2	5.50	5.50
86-110	No. 2	6.00	6.00
150	No. 3	9.00	9.00
180	No. 3	10.00	10.00
200	No. 3	10.50	10.50
250	No. 3	11.50	11.50
280	No. 3	12.50	12.50
300	No. 3	13.00	13.00
Red Oils:			
180	No. 5	9.00	9.00
200	No. 5	9.50	9.50
250	No. 5	10.50	10.50
280	No. 5	11.50	11.50
300	No. 5	11.75	11.75

Note: Viscous oils, 15-25 p.p., generally are quoted 0.5c under 0-10 p.p. oils. Non-viscous oils, 15-25 p.p., generally are quoted 0.25c under 0-10 p.p. oils. Viscous oils (150-300 vis.), No. 4 color, generally are quoted 0.5c above No. 5 color oils.

CHICAGO (Vis. at 100° F.)

Pale Oils **0 to 10 p.p.:

Vis.	Color		
60-85	No. 2	7.25	7.25
86-110	No. 2	7.75	7.75
150	No. 3	10.00	10.00
180	No. 3	11.00	11.00
200	No. 3	11.50	11.50
250	No. 3	12.50	12.50
Red Oils:			
180	No. 5	10.00	10.00
200	No. 5	10.50	10.50
250	No. 5	11.50	11.50
280	No. 5	12.50	12.50
300	No. 5	12.75	12.75

**Viscous oils, 15 to 30 p.p. are quoted 0.5c lower, 60-85 and 86-110 No. 2 non-viscous oils, 15 to 30 p.p., are quoted 0.25c lower. To obtain delivered prices in Chicago, add 0.25c per gal.

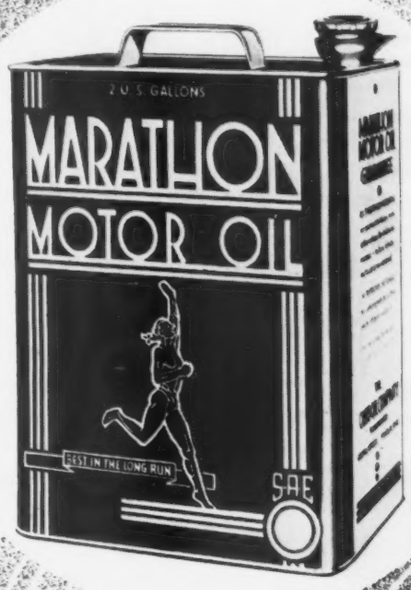
Cylinder Stocks

MID-CONTINENT (F.o.b. Tulsa basis).

Bright Stocks:		
190-200 Vis. at 210° D	20.00	20.00
150-160 Vis. at 210° D:		
0 to 10 p.p.	17.00	17.00
10 to 25 p.p.	16.50	16.50
25 to 40 p.p.	16.00	16.00
150-160 vis. at 210° E	16.00	16.00

MARATHON

MOTOR OIL



BEST IN THE LONG RUN. Change to MARATHON MOTOR OILS now and see for yourself. It's a full-bodied long-lived oil that provides instant flow at the touch of the starter and perfect lubrication at all times.

MARATHON MOTOR OILS are sold only in sealed, tamper-proof containers.

JOBBERS: Why not investigate the Exclusive Territory Franchise offered by The Ohio Oil Company?

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LINCO

THE OHIO OIL COMPANY

GENERAL OFFICES - - - - FINDLAY, OHIO

ROBINSON, ILLINOIS — TULSA, OKLAHOMA — FT. WORTH, TEXAS

from suppliers' unwillingness to sell than from lack of demand, but that heavy fuel oils and gasoline were fairly free.

It was reported during the week that a cargo of Grade C bunker oil had been sold at $0.85 a barrel but this could not be confirmed. This product, however, was reported available by traders at $0.85.

No cargo gasoline sales were reported in the open market but low octane grades were quoted at 0.125 cent lower by some suppliers. The 64-66, 375 e. p. grade was reported offered for export at 6.25 cents, compared to previous quotations and the last reported sale of 6.375 cents. Low octane U. S. Motor grade was reported at 6 cents by some traders, either for export or domestic movement.

Kerosine and light fuel oils were reported tight, particularly for deferred lifting at present quoted prices. Some traders said they doubted if a November cargo of No. 2 fuel could be had at 4.50 cents, although an October one might be picked up at this figure.

Wax

Scale More Active

NEW YORK, Oct. 4. — An improved demand for crude scale wax was reported generally by traders the past week. This demand was coming both from domestic and foreign buyers, they said. However, some said that movement still was not particularly heavy, although better than it had been. The bulk of quotations continued to range from 2.90 to 2.95 cents a pound for 124-126 white crude scale. Other quotations heard, although in the minority, were 2.85 and 3 cents.

Movement of fully refined wax continued on a steady basis, traders said. Demand was keeping pace with supply, they reported, and prices were unchanged.

California

Japanese Buying Active

N. P. N. News Bureau

LOS ANGELES, Oct. 2. — Far East inquiry for California petroleum products continues to feature local bulk markets. As part of a 2,500,000-barrel inquiry made by Japan for refinable crude, Union Oil Co. was awarded a contract on a 100,000-ton lot not previously closed. This is for Los Angeles Basin oil with an aviation gasoline content in excess of 20 per cent. The price was reported as $1.55 per barrel, f. o. b. Los Angeles, net.

Another supplier was understood to have closed a sale on 20,000 tons of 24.9 gravity blended diesel oil to a Japanese buyer at a price of $1.47 per barrel here.

Local refiners were declared unwilling to quote on cargo lots of gas oil at this time, but were just covering commitments and attempting to build stocks against winter demands. Spot lots of this commodity were reported available in 1000 to 2000-barrel quantities at prices of $1.35 to $1.40, with larger amounts bringing $1.45 a barrel.

Domestic markets showed no particular activity, although burning oils remained in demand, and there was evidence in the opinion of some observers that Standard of California's announced plan to post a minimum price of 75 cents a barrel for Wilmington crude oil had firmed the fuel oil market.

The company was reported ready to offer three-year contracts for all oil produced in conformity with proration to 80 per cent of well potential. This was expected to remove much of the 40 to 50-cent crude in Wilmington and make it unprofitable to produce fuel oil for sale at 55 to 65 cents a barrel.

Some gasoline was reported sold by one independent refiner in the Los Angeles Basin at a rack price of 7.50 cents, exclusive of all tax, but other independents offering this competitive grade were maintaining an 8-cent rack price.

Quotations on other products were generally unchanged.

Fuel Oil . . . . .

N. P. N. News Bureau

CHICAGO, Oct. 4. — Light fuel oils were the subject of lively speculative discussion in the Mid-Western market last week.

Current prices for light grades of heating oil are 0.875-cent above prices at this time last year, and are only 0.125-cent under the peak for prices during the 1936-1937 heating oil season. This price comparison is more weighty when it is considered that very little burner fuel has been consumed so far this season.

Prices for those oils were unchanged last week, but at the same time offerings were limited and buying inquiries were in the market.

Michigan light fuel was moving well both in and out of the state and prices were steady to higher.

Heavy fuel continued listless, although price shading was reported to have virtually disappeared.

* * *

NEW YORK, Oct. 4. — A fairly steady tank car and barge movement of light fuel oils, particularly to contract buyers, was the general report received about eastern terminal markets the past week. At New York harbor an occasional report of No. 2 fuel oil being offered in barge lots at 5 cents a gallon was heard, but in general, movement appeared to be at 5.125 cents in the open spot market.

Heavy fuel oils were listless, traders reported. Distributors' storage apparently were well filled and demand was reported light. The majority of price quotations, however, remained unchanged, it was said.

* * *

TULSA, Oct. 4. — Northern buyers continued to seek out supplies of Mid-Continent light fuel oils. Some of these buyers were being supplied from Michigan refineries and inquiries were less insistent. Orders, however, still outdistanced available supplies, reports indicated. Mid-Continent refiners continued their policies of accumulating these oils for contract customers.

Prices for light fuels were on the upgrade, although lack of available supplies precluded drastic reactions.

Shipments of heavy fuels to railroads were off some as freight business failed to reach expected volume. While a few refiners were taking small quantities to storage, stock positions generally was comfortable, refiners said.

Railway Oil Purchases

CHICAGO, Oct. 4.—American railroads purchased 59,900,000 barrels of fuel oil, 47,100,000 gallons of gasoline, and 12,800,000 gallons of Diesel fuel in 1936, M. J. Gormley, executive assistant, Assn. of American Railroads, said in a speech here before the recent convention of the Railway Fuel and Traveling Engineers' Assn.

TANK WAGON MARKETS, HEATING OILS

Prices in Effect Oct. 4, 1937

Following are tank wagon prices of various grades of heating oil at the points shown in various territories. Prices are in cents per gallon.

	No. 1	No. 2	No. 3	No. 4
S. O. NEW JERSEY				
Newark, N. J.	*	7.00	7.00	7.00
Atlantic City, N. J.	*	7.00	7.00	7.00
Baltimore, Md.	8.00	7.00	7.00	7.00
Washington, D. C.	8.50	7.50	7.50	7.50
SOCONY-VACUUM OIL CO. INC. (S. O. New York Division)				
New York City	*	7.50	7.50	7.50
Albany, N. Y.	*	7.50	7.50	7.50
Rochester, N. Y.	*	7.50	7.50	7.50
Boston, Mass.	*	7.00	7.00	7.00
Bangor, Me.	*	8.00	8.00	8.00
Manchester, N. H.	*	8.00	8.00	8.00
Burlington, Vt.	*	8.00	8.00	8.00
New Haven, Conn.	*	7.50	7.50	7.50
Providence, R. I.	*	7	7	7

*Prices for No. 1 fuel in S. O. New Jersey and Socony-Vacuum territories same as for kerosine, which see in tank wagon table for various cities; prices change with kerosine.

	No. 1	No. 2	No. 3	No. 4
ATLANTIC REFINING				
Philadelphia, Pa.	7.25	6.50	6.50	6.50
Allentown, Pa.	7.25	6.50	6.50	6.50
Wilmington, Del.	7.75	7.00	7.00	7.00
Springfield, Mass.	9.00	7.50	....	7.50
Worcester, Mass.	9.00	7.50	....	7.50
Hartford, Conn.	9.00	7.50	....	7.50

S. O. OHIO

*Ohio Statewide	8.00	8.00	7.50	6.75

Note: S. O. Ohio prices are for hose dumps, bucket dumps are 0.5c per gallon higher.

*Except Cleveland Division and City of Toledo. In Cleveland Division (Cuyahoga, Lake and Geauga counties), No. 1 price is same as statewide; Nos. 2, 3 and 4 are 0.5c higher; No. 5 is priced 0.25c lower than No. 4. In Toledo No. 2 is 0.5c lower than statewide, others same.

S. O. INDIANA

Stanolex Fuel and Furnace Oils

	No. 1 Fuel	Stanolex Furnace
Chicago	8.8	7.00
Indianapolis	....	*11.8
Detroit	....	7.1
Milwaukee	8	7.3
Minneapolis	7.5	7.5
Sioux City	7.1	7.1
St. Louis	7.5	6.8
Kansas City	6.5	6.5

*Includes state tax of 4c.

Note: Small-lot deliveries of light fuel oils range up to 2c higher than above quotations.

REFINERY TANK CAR MARKETS

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days) unless otherwise stated. Prices in cents per gallon, except heavy fuel oils in dollars per barrel, tank car lots, f.o.b. refineries in districts designated, except where otherwise noted. Inter-refinery and export prices not included, unless so stated in the respective markets. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude.

Cylinder Stocks (cont'd)

Prices Effective	Oct. 4	Sept. 27
Mid-Continent (cont'd)		
120 Vis. at 210° D:		
0 to 10 p.p.	16.00	16.00
10 to 25 p.p.	15.50	15.50
25 to 40 p.p.	15.00	15.00
600 S.R. Dark Green	5.00 – 7.50	5.00 – 7.50
600 S.R. Olive Green	7.00 – 9.50	7.00 – 9.50
631 S.R.	‡15.00	‡15.50
Black Oil	3.50 – 4.00	3.50 – 4.00
CHICAGO (Viscosity at 210°)		
Unfiltered Steam Refined:		
140	9.00	9.00
160	10.00	10.00
200	11.00	11.00
Bright stocks, 160 vis. at 210, No. 8 color:		
0 to 10 p.p.	18.75	(a)18.75
15 to 25 p.p.	18.25	(a)18.25
30 to 40 p.p.	17.75	(a)17.75
E filtered Cyl. Stock	14.50	(a)14.50

To obtain prices delivered in Chicago, add 0.25c per gal.

‡Only one refiner quoting.

(a) Correction: This price correct for Sept. 27, instead of prices published Sept. 29, issue page 49.

Prices Effective	Oct. 4	Sept. 27
WESTERN PENNA.		
600 S.R. filterable	11.25 –11.75	12.25 –12.75
650 S.R.	15.00 –15.50	16.00 –16.50
600 fl.	16.50 –17.00	17.50 –18.00
630 fl.	20.50 –21.00	21.50 –22.00
600 Warren E	15.50 –16.50	16.50 –17.50
Bright stock, 145-155 vis. at 210°, 540-550 flash, No. 8 color:		
10 p.t.	21.00 –21.50	21.00 –21.50
15 p.t.	20.00 –20.50	20.00 –20.50
20 p.t.	19.00 –19.50	19.00 –19.50
25 p.t.	18.00 –18.50	18.00 –18.50

Petrolatums

WESTERN PENNA. (Per lb., in barrels, carload lots. In tank cars, 0.5c per lb. less).

Snow white	6.625– 6.75	6.625– 6.75
Lily White	5.625– 5.75	5.625– 5.75
Cream White	4.625– 4.75	4.625– 4.75
Light Amber	2.75 – 2.875	2.75 – 2.875
Amber	2.50 – 2.625	2.50 – 2.625
Red	2.125– 2.375	2.125– 2.375

Wax

Prices Effective	Oct. 4	Sept. 27
WESTERN PENNA. (Per lb., f.o.b. N. Y. basis)		
122-124 w.c. scale, A.m.p.	2.95 – 3.00	2.95 – 3.00
124-126 w.c. scale, A.m.p.	2.95 – 3.00	2.95 – 3.00
OKLAHOMA (Per lb. in bbls.; in a few instances, per lb. in burlap bags).		
124-126 w.c. scale, A.m.p.	3.00 – 3.125	3.00 – 3.125

CHICAGO (In bags, carload lots. Melting points are E.M.P. (A.S.T.M.) methods; add 3° F. to convert into A.m.p.)

Fully refined:		
122-124	4.65 – 4.75	4.65 – 4.75
125-127	4.90 – 5.00	4.90 – 5.00
127-129	5.05 – 5.15	5.05 – 5.15
130-132	**5.45 – 5.55	**5.45 – 5.55
132-134	**5.70 – 5.80	**5.70 – 5.80
135-137	**6.45 – 6.55	**6.45 – 6.55

**Same prices quoted in bags or slabs loose.

MID-WESTERN TANK CAR MARKET

Prices are those made by Chicago sellers, on Group 3 (Oklahoma) freight basis, although shipments may originate in other South-western or Mid-western refining districts

Gasoline

Prices Effective	Oct. 4	Sept. 27
U. S. Motor:		
62 oct. and below	4.625– 5.00	4.75 – 5.00
63-67 oct.	5.125– 5.625	5.125– 5.625
68-70 oct. (regular)	5.625– 6.00	5.625– 6.00
60-62, 400 e.p.	4.75 – 5.00	4.75 – 5.00
64-66, 375 e.p.	**5.00	5.125– 5.50
68-70, 350-360 e.p.	**5.25	5.00 – 5.50

Kerosine

41-43 w.w.	4.00 – 4.25	4.00 – 4.25
42-44 w.w.	4.125– 4.375	4.125– 4.375

*Nominal

**One seller quoting.

Fuel *and* Gas Oils

Prices Effective	Oct. 4	Sept. 27
Domestic:		
No. 1 p.w.	3.875– 4.125	3.875– 4.00
No. 1 straw	3.75 – 4.00	3.75 – 3.875
No. 2 straw	3.50 – 3.75	3.50 – 3.625
No. 2 dark	3.375– 3.625	3.375– 3.50
No. 3	3.25 – 3.50	3.25 – 3.375
No. 4	$1.05 –$1.10	$1.05 –$1.10
No. 5	$0.80 –$0.85	$0.80 –$0.85
Industrial:		
No. 4	$0.95 –$1.10	$0.95 –$1.10
No. 5	$0.80 –$0.85	$0.80 –$0.85

Prices Effective	Oct. 4	Sept. 27
Industrial (cont'd)		
No. 6	$0.70 –$0.75	$0.70 –$0.75
U. G. I. gas oil	2.875– 3.25	2.875– 3.25

Naphtha and Solvent

Stoddard solvent	6.875	6.875
Cleaners' naphtha	7.375	7.375
V. M. & P. naphtha	7.375	7.375
Mineral spirits	6.375	6.375
Rubber solvent	7.375	7.375
Lacquer diluent	8.375	8.375

DAILY GASOLINE PRICES

Daily range of gasoline prices as reported in PLATT'S OILGRAM. (Week Ended Oct. 1, 1937)

	Sept. 27	Sept. 28	Sept. 29	Sept. 30	Oct. 1
U. S. Motor, 62 oct. & below:					
*North Texas	5.00 – 5.25	5.00 – 5.25	5.00 – 5.25	5.00 – 5.25	5.00 – 5.25
West Texas	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125
Mid-Western (Group 3 basis)	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00	4.75 – 5.00
U. S. Motor, 63-67 oct.:					
(a)*North Texas	5.375– 5.625	5.375– 5.625	5.375– 5.625	5.375– 5.625	5.50
(a) West Texas	5.375– 5.50	5.375– 5.50	5.375– 5.50	5.375– 5.50	5.375– 5.50
Mid-Western (Group 3 basis)	5.125– 5.625	5.125– 5.625	5.125– 5.625	5.125– 5.625	5.125– 5.625
U. S. Motor, 68-70 oct. (regular)					
(a)*North Texas	6.00	6.00	6.00	6.00	5.75
(a) West Texas	6.00 – 6.125	6.00 – 6.125	6.00 – 6.125	6.00 – 6.125	5.625– 5.875
Mid-Western (Group 3 basis)	5.625– 6.00	5.625– 6.00	5.625– 6.00	5.625– 6.00	5.625– 6.00
U. S. Motor (Octane Test L-3), in Oklahoma:					
62 oct. & below	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125	5.00 – 5.125
63-66 oct.	5.375– 5.50	5.375– 5.50	5.375– 5.50	5.375– 5.50	5.375– 5.50
67-69 oct.	5.625– 5.875	5.625– 5.875	5.625– 5.875	5.625– 5.875	5.625– 5.875
70-72 oct.	6.00 – 6.125	6.00 – 6.125	6.00 – 6.125	6.00 – 6.125	6.00 – 6.125
Motor Gasoline, 60-64 oct.					
New York harbor	†7.25 – 7.75	†7.25 – 7.75	†7.25 – 7.75	†7.25 – 7.75	†7.25 – 7.75
Philadelphia district	†7.25 – 7.50	†7.25 – 7.50	†7.25 – 7.50	†7.25 – 7.50	†7.25 – 7.50
Baltimore district	†7.25 – 7.75	†7.25 – 7.75	†7.25 – 7.75	†7.25 – 7.75	†7.25 – 7.75
Motor Gasoline, 65 oct. & above					
New York harbor††	†7.50 – 8.00	†7.50 – 8.00	†7.50 – 8.00	†7.50 – 8.00	†7.50 – 8.00
Philadelphia district	†7.50 – 7.75	†7.50 – 7.75	†7.50 – 7.75	†7.50 – 7.75	†7.50 – 7.75
Baltimore district	†7.50 – 8.00	†7.50 – 8.00	†7.50 – 8.00	†7.50 – 8.00	†7.50 – 8.00
U. S. Motor, 58-62°					
Bradford-Warren (Western Penna.)	6.00 – 6.25	6.00 – 6.25	6.00 – 6.25	6.00 – 6.25	6.00 – 6.25
Other districts (Western Penna.)	5.75 – 5.875	5.75 – 5.875	5.75 – 5.875	5.75 – 5.875	5.75 – 5.875
Motor Gasoline, Min. 60 oct.					
Bradford-Warren (Western Penna.)	†7.50 – 7.75	†7.50 – 7.75	†7.50 – 7.75	†7.50 – 7.75	†7.50 – 7.75
Other districts (Western Penna.)	7.375– 7.75	7.375– 7.75	7.375– 7.75	7.375– 7.75	7.375– 7.75
Motor Gasoline, Min. 65 oct.					
Bradford-Warren (Western Penna.)	†7.75 – 8.00	†7.75 – 8.00	†7.75 – 8.00	†7.75 – 8.00	†7.75 – 8.00
Other districts (Western Penna.)	7.50 – 8.00	7.50 – 8.00	7.50 – 8.00	7.50 – 8.00	7.50 – 8.00

*For shipment to Texas and New Mexico destinations; Group 3 prices are quoted on northern shipment.

†Nominal.

(a) Beginning Oct. 1, Texas octane numbers changed to 63-66, 67-69, and 70-72, according to octane test L-3. Price on 70-72 octane, Oct. 1, was: North Texas 6.00c, and West Texas 6.00-6.125c.

TANK WAGON MARKETS

Tax column includes 1c federal tax, state gasoline tax, also city and county taxes as indicated in footnotes, and inspection fees, as shown in general footnote. These prices in effect Oct. 4, 1937, as posted by principal marketing companies at their headquarters offices, but subject to later corrections

S. O. New Jersey

ESSOLENE

	Consumer Tank Car	Dealer T.W.	Taxes	Posted S.S.	Kerosine T.W.
Atlantic City, N. J.	8	9.5	4	*	9
Newark, N. J.	8	9.5	4	*	9
Annapolis, Md.	9.1	10.6	5	*	9.5
Baltimore, Md.	8.5	10	5	18.5	9
Cumberland, Md.	9.9	12.4	5	*	10
Washington, D. C.	8	9.5	3	16	9.5
Danville, Va.	9.7	12.2	6	*	12.9
Norfolk, Va.	8.5	11	6	*	11.5
Petersburg, Va.	8.8	11.3	6	*	11.7
Richmond, Va.	8.8	11.3	6	*	11.7
Roanoke, Va.	10	12.5	6	*	12.9
Charleston, W. Va.	9.3	11.8	6	*	12.6
Parkersburg, W. Va.	8.6	11.1	6	*	11.2
Wheeling, W. Va.	9.5	11	6	*	12.2
Charlotte, N. C.	9.9	12.4	7	*	12.6
Hickory, N. C.	10.4	12.9	7	*	13
Mt. Airy, N. C.	10.2	12.7	7	*	12.8
Raleigh, N. C.	9.5	12	7	*	12.1
Salisbury, N. C.	10	12.5	7	*	12.7
Charleston, S. C.	8.5	11	7	*	11.1
Columbia, S. C.	9.5	12	7	*	12.1
Spartanburg, S. C.	10.2	12.7	7	*	12.9

*S. O. New Jersey transferred stations to dealers; no prices available.

Price basis to undivided dealers: Dealer t.w. price less 0.5c per gal.

Price basis to commercial consumers: To contract accounts, purchasing at least one full compartment at a time by hose connection: Effective March 12, 1937, in New Jersey, and March 8 in Maryland, District of Columbia, and in Arlington and Fairfax Counties in Virginia, on yearly purchases: from 2,500 to 100,000 gals., consumer t.w. price at time and place of delivery; 100,000 gals. per year, consumer tank car price, plus 0.5c per gal. Generally consumer t.w. price in foregoing states is equivalent of dealer t.w. price, less 0.5c per gal.

Effective May 15, 1937, on Essolene and Esso (by tank wagon) in North and South Carolina, West Virginia and Virginia (except Arlington and Fairfax Counties, which see above), commercial consumers taking deliveries of 50 gals. (West Va. 100 gals.) or more at one time will be billed at the posted consumer t.w. price. Deliveries less than 50 gals. (West Va. 100 gals.) will be billed at 4c per gal. over posted consumer t.w. price. Generally, posted consumer t.w. price will be equivalent to the dealer price less 0.5c per gal.

Kerosine Discount: 1c off t.w. price for 25 gals or more, under contract thru territory (Baltimore City contract not necessary) except no discount in state of New Jersey.

Socony-Vacuum Oil Co., Inc.

(S. O. New York Division)

SOCONY MOBILGAS

	Consumer Tank Car	"Split" Dealer T.W.	Taxes	Total "Split" Dealer T.W.	Kerosine T.W.
Metropolitan N. Y. City: Boroughs of Manhattan, Bronx and Brooklyn (Kings and Queens)	8.5	10	*5	15	9
Borough of Richmond (Staten Is.)	8.5	10	*5	15	9
Albany, N. Y.	8.5	10	5	15	9
Binghamton, N. Y.	9.25	10.8	5	15.8	9
Buffalo, N. Y.	9.04	10.8	5	15.8	8.5
Jamestown, N. Y.	8.78	11.3	5	16.3	8.25
Plattsburg, N. Y.	8.9	10.9	5	15.9	9.5
Rochester, N. Y.	9.17	10.5	5	15.5	8.5
Syracuse, N. Y.	9.12	10.5	5	15.5	9.5
Danbury, Conn.	8.8	10.3	4	14.3	9
Hartford, Conn.	8.6	10.1	4	14.1	9
New Haven, Conn.	8.5	10	4	14	9
Bangor, Me.	9.1	11.3	5	16.3	9.5
Portland, Me.	8.5	10.8	5	15.8	8.75
Boston, Mass.	8.5	9.5	4	13.5	8.5
Concord, N. H.	9.2	11.8	5	16.8	9.5
Lancaster, N. H.	10.1	12.8	5	17.8	10.25
Manchester, N. H.	9	11.3	5	16.3	9.5
Providence, R. I.	8.5	10	4	14	8.5
Burlington, Vt.	8.9	10.9	5	15.9	9.5
Rutland, Vt.	9.2	11.2	5	16.2	9

*Plus 2% city sales tax computed at time of each sale.

Note: Socony-Vacuum has transferred all service stations to dealers; no prices available.

Price basis to undivided dealers: 0.5c less than "split" dealer t.w.

Price basis to commercial consumers: Effective about Nov. 15, 1936 in New York and New England, for tank wagon delivery: monthly purchases of 25,000 gals. or over, pay consumer tank car price at point of delivery, plus 0.5c gal.; monthly purchases of 5,000 to 25,000 gals., pay undivided dealer tank wagon price at point of delivery; monthly purchases of less than 5,000 gals., pay divided dealer tank wagon price at point of delivery. Private consumers pay undivided dealer tank wagon price at point of delivery, plus 2c gal.

Atlantic Refining

ATLANTIC WHITE FLASH GASOLINE

	Commercial Tank Car	All Tax	Total Dealer T.W.	S.S.	Kerosine T.W.
Philadelphia, Pa.	7.5	5	14	17	10.5
Pittsburgh	8.5	5	15.5	20	11
Allentown	8.5	5	15	**	11
Erie	8	5	14.5	**	10
Scranton	8.5	5	15	**	11
Altoona	8.5	5	15.5	**	11
Harrisburg	8.5	5	15	**	11
Williamsport	8.5	5	15.5	**	11
Dover, Del.	...	5	14.5	**	11
Wilmington	...	5	14.5	**	11
Boston, Mass.	...	4	13.5	**	8.5
Springfield, Mass.	...	4	14.3	**	9
Worcester, Mass.	...	4	14.8	**	9
Fall River, Mass.	...	4	13	**	8.5
Hartford, Conn.	...	4	14.1	**	9
New Haven, Conn.	...	4	14	**	9
Providence, R. I.	...	4	14	**	8.5
Atlantic City, N. J.	...	4	13.5	**	9
Camden, N. J.	...	4	13.5	**	9
Trenton, N. J.	...	4	13.5	**	9
Annapolis, Md.	...	5	15.6	**	9.5
Baltimore, Md.	...	5	15	**	9
Hagerstown, Md.	...	5	16	**	10
Richmond, Va.	...	6	17.3	**	11.7
Wilmington, N. C.	...	7	18.1	**	11.3
Brunswick, Ga.	...	7	16	**	*13
Jacksonville, Fla.	...	8	17.5	**	11

*Georgia has kerosine tax of 1c per gal., not included in above price.

**Atlantic Refining transferred stations to dealers; no prices available.

Price basis to undivided dealers: Dealer t.w. less 0.5c per gal.

Price basis to commercial consumers: in Penna. and Delaware, effective Mar. 11, 1937, on yearly gasoline purchases to contract accounts taking full compartment hose deliveries, using 100,000 gals. or more per year, tank car price plus 0.5c per gal.; consumers taking less than 100,000 gals., undivided dealer price. Consumers under contract and not under contract, taking less than full compartment delivery, and consumers not under contract taking full compartment delivery, get divided dealer price. Consumers taking less than 25 gals., t.w delivery, get 4c above undivided dealer price.

Discount on kerosine: Effective Oct. 29, 1936, in Pennsylvania and Delaware. 2c per gal. off t.w. price on t.w. deliveries of 25 gals. or more at one time.

S. O. Ohio

SOHIO X-70 GASOLINE

	All Tax	**Consumer T.W.	Commercial T.W.	†Divided Dlr.	Kerosine T.W.
Ohio State-Wide	5	17	15.5	16	*13.5
Defiance county	5	16	‡	15	....
Erie, Fulton, Hamilton, Henry, Lucas, Ottawa, Sandusky, Williams & Wood counties	5	17	‡	16	....
Counties where prices are below statewide:					
Columbiana	5	16.5	15	15.5	....
Franklin, Knox and Pickaway	5	16		14.5	15 ....
Paulding	5	15.5	14	14.5	....

RENOWN GASOLINE (Third Grade)

Ohio State-Wide	5	16.5	15	15.5	....
Defiance county	5	15.5	‡	14.5	....
Erie, Fulton, Lucas, Ottawa, Sandusky, Williams and Wood	5	16.5	‡	15.5	....
Hamilton county	5	17	‡	16	....
Counties where prices are below statewide:					
Columbiana	5	16	14.5	15	....
Franklin, Knox, and Pickaway	5	15.5	14	14.5	....
Paulding	5	15	13.5	14	....
Counties where prices are above statewide: Butler, Clermont, Darke, Greene, Hocking, Miami, Montgomery, Preble and Warren	5	17	15.5	16	....

S. O. Ohio Cont'd

KEROSINE PRICES

(Off Statewide Level)

Kerosine prices are off statewide level in the following counties:

Washington *13

Allen, Auglaize, Champaign, Columbiana, Darke, Geauga, Greene, Hancock, Hardin, Logan, Mahoning, Mercer, Preble, Putnam, Shelby, Trumbull, Union, Van Wert and Wyandot: *12.5

Paulding *12

Ashtabula *11.5

Fayette, Licking, Madison, Pickaway, Portage and Summit *9.5

*Kerosine prices include 1c state tax.

**Tank wagon price to commercial consumers, in t.w. deliveries of 25 gals. or more; less than 25-gal. deliveries get s.s. price. Price to undivided dealers is same as to commercial consumers.

Discounts to Commercial Consumers on contract: Effective Aug. 12, thru Ohio, for 20,000 gals. of gasoline or more per month, 1c per gal. off commercial consumer t.w. price. For counties where no commercial t.w. is posted, see following paragraph.

‡Commercial consumer t.w. posted price discont'd and Q.D.A. to t.w. consumers put into effect July 19, 1937, in counties of Defiance, Erie, Fulton, Hamilton, Henry, Lucas, Ottawa, Sandusky, Williams and Wood. For further information, write National Petroleum News.

†This price also to authorized agents, exclusive of 0.5c rental.

Sales tax: Ohio's 3% sales tax, effective Jan. 27, 1935, is added "where assessable, to regular posted prices", S. O. Ohio says.

On kerosine, prices to resellers and commercial consumers are posted generally at 3c per gal. below consumer t.w. price in any quantity, when such prices are on state-wide level.

S. O. Kentucky

CROWN GASOLINE

(Regular Grade)

	Consumer T.W.	All Tax	Total Consumer T.W.	Net Dlr.	Kerosine T.W.
Covington, Ky.	13.5	6	19.5	16.5	11
Lexington, Ky.	14	6	20	17	11
Louisville, Ky.	14	6	20	17	10.5
Paducah, Ky.	14	6	20	17	10
Jackson, Miss.	14	7	21	18	*13
Vicksburg, Miss.	13.5	7	20.5	17.5	*13
Birmingham, Ala.	14	*8	22	19	12
Mobile, Ala.	13	*9	22	19	11
Montgomery, Ala.	13	*9	22	19	*14.5
Atlanta, Ga.	14	7	21	18	*12
Augusta, Ga.	14	7	21	18	*14
Macon, Ga.	14.5	7	21.5	18.5	*14.5
Savannah, Ga.	12	7	19	16	*12
Jacksonville, Fla.	12.5	8	20.5	17.5	10
Miami, Fla.	12.5	8	20.5	17.5	12
Pensacola, Fla.	13	*9	22	19	12
Tampa, Fla.	12	8		17	10.5

KYSO GASOLINE

(Third Grade)

Covington, Ky.	12	6	18	15.5	....
Lexington, Ky.	12.25	6	18.25	15.75	....
Louisville, Ky.	12	6	18	15.5	....
Paducah, Ky.	12	6	18	15.5	....
Jackson, Miss.	12.5	7	19.5	17	....
Vicksburg, Miss.	12	7	19	16.5	....
Birmingham, Ala.	11.5	*8	19.5	17	....
Mobile, Ala.	10.5	*9	19.5	17	....
Montgomery, Ala.	10.5	*9	19.5	17	....
Atlanta, Ga.	12	7	19	16.5	....
Augusta, Ga.	12	7	19	16.5	....
Macon, Ga.	12.5	7	19.5	17	....
Savannah, Ga.	9.5	7	16.5	14	....
Pensacola, Fla.	11	*9	20	17.5	....

Discounts to tank wagon consumers: Effective Jan. 4, 1937, thru territory, on Crown gasoline, 3c per gal. below consumer t.w. price; on Kyso, 2.5c below.

Discounts on kerosine: Prices in Kentucky are net, but in other states subject to 2c discount.

**Taxes*: in the tax column is included these city and county gasoline taxes at the following points: Mobile, 2c city; Birmingham, 1c city; Montgomery, 1c city and 1c county; Pensacola, 1c city. Georgia and Mississippi kerosine prices include 1c state tax. Montgomery kerosine price includes 1c city tax.

Above prices include these inspection fees on both gasoline and kerosine, per gallon, figured on basis of 50 gallons per barrel:

Alabama, 1/40c on gasoline, 1/2c on kerosine; Arkansas, 1/5c per gal. in a single barrel, 1/20c per gal. in bulk; Florida, 1/8c; Illinois, 3/100c; Indiana, 1/2c per gal. in a single barrel; 3/10c per gal. in lots of 2 to 10 bbls., 1/5c for 10 to 50 bbls., 2/25c for over 50 bbls.; Kansas, 1/50c, (3/50c can be charged to meet inspection department expenses); Louisiana, 1/32c; Minnesota, 1/25c; Missouri, 3/100c; Nebraska, 3/100c; Nevada, gasoline, 1/20c; North Carolina, 1/4c; North Dakota, 1/20c; Oklahoma, 2/25c per gal., in lots of more than 50 bbls., 1/5c in lots less than 50 bbls.; South Carolina, 1/8c; South Dakota, 1/10c; Tennessee, 2/5c; and Wisconsin, 1/25c.

Kerosine inspection fee only: Iowa, 2/25c; Michigan, 4/5c per gal. for first 2 bbls.; 3/5c for next 3; 2/5c for next 5; 3/10c for next 15, and 1/5c per gal. in lots over 25 bbls.

TANK WAGON MARKETS

Tax column includes 1c federal tax, state gasoline tax, also city and county taxes as indicated in footnotes, and inspection fees, as shown in general footnote. These prices in effect Oct. 4, 1937, as posted by principal marketing companies at their headquarters offices, but subject to later corrections

S. O. Indiana

	Red Crown Tax	Red Crown Total T.W.	Stanolind T.W.	Kerosine T.W.
Chicago, Ill.	4	15.5	13.5	12	10.1
Decatur, Ill.	4	15.5	14	12	10.1
Joliet, Ill.	4	15.5	14	13.5	10.1
Peoria, Ill.	4	15.5	14	13.5	10.1
Quincy, Ill.	4	15.3	13.8	12.4	9.9
Indianapolis, Ind.	5	17.2	15.7	14.7	*14.8
Evansville, Ind.	5	17	15.5	13	*14.6
South Bend, Ind.	5	17.4	15.9	15.4	*13.6
Detroit, Mich.	4	15.4	13.9	13.4	9.8
Grand Rapids, Mich.	4	16.5	15	14.5	10.9
Saginaw, Mich.	4	16.3	14.8	14.3	8.5
Green Bay, Wis.	5	17.2	15.7	14.7	10.8
Milwaukee, Wis.	5	16.8	15.3	14.2	10.4
La Crosse, Wis.	5	16.9	15.4	14.9	10.5
Minneapolis-St. Paul.	5	16.9	15.4	14.9	10.5
Duluth, Minn.	5	17.3	15.8	15.3	10.9
Mankato, Minn.	5	16.9	15.4	14.9	10.5
Des Moines, Ia.	4	15.3	13.8	12.4	*12.9
Sioux City, Ia.	4	15.5	14	13.5	*13.1
Davenport, Ia.	4	15.5	14	13.5	*13.1
Mason City, Ia.	4	15.7	14.2	13.7	*13.3
St. Louis, Mo.	*4	15.2	13.7	11.2	9.8
Kansas City, Mo.	*4	14.9	13.4	12.9	8
St. Joseph, Mo.	*4	14.9	12.4	12	8.5
Fargo, N. D.	4	16.9	15.4	14.9	11.5
Minot, N. D.	4	18.1	16.6	16.1	12.7
Huron, S. D.	*5	17.3	15.8	15.3	*10.9
Wichita, Kans.	4	14.4	12.9	11.5	8

*Taxes: in the tax column is included these city and state gasoline taxes at following points: Kansas City, St. Joseph and St. Louis, 1c city tax; South Dakota, 0.1c sales tax. State Kerosine taxes: Indiana, 4c; Iowa, 3c, all included in above prices.

Discount to commercial consumers: Effective Jan. 1, 1935, thru territory, except Michigan effective Feb. 1, on purchases per month, discount off t.w. prices; all gasolines, 25 to 1,000 gals., at t.w. price; 1,000 gals., or more, 1.5c off t.w. on Ethyl and Red Crown, and 1c on Stanolind (latter effective June 9, 1937). Minimum delivery is 25 gals.

S. O. Nebraska

STANDARD RED CROWN GASOLINE

	All Tax	T.W. Total	Dealer Total	Kerosine T.W.
Omaha, Neb.	6	17.9	16.4	10.4
McCook	6	18	14	10
Norfolk	6	18.3	16.8	10.8
North Platte	6	18.7	17.2	11.2
Scottabluff	6	19.4	15.9	11.9

Discounts to commercial consumers: for tank wagon deliveries covered only by Standard Commercial Consumer Contract, effective January 1, 1935.

S. O. Louisiana

ESSOLENE

	Consumer Tank Car	Dealer T.W.	Taxes	Posted S.S.	Kerosine T.W.
Little Rock, Ark.	8.5	11	7.5	**	11.5
Alexandria, La.	8.5	11	8	**	*12
Baton Rouge, La.	8	10.5	8	22	*12
New Orleans, La.	8	10.5	*10	24	*13
Lake Charles, La.	9	11.5	8	**	*12.5
Shreveport, La.	7.5	10	8	**	*9.5
Lafayette, La.	9	11.5	8	**	*13
Bristol, Tenn.	11	12.25	8	**	14.5
Chattanooga, Tenn.	10.5	13	8	**	13.5
Knoxville, Tenn.	11	13.5	8	**	14
Memphis, Tenn.	9	11.5	8	**	12
Nashville, Tenn.	10	12.5	8	**	11.5

*New Orleans gasoline tax includes 7c state, 1c federal, and 2c parish tax. Louisiana kerosine prices include 1c state tax; in addition New Orleans has 1c parish tax.

**S. O. Louisiana transferred stations to dealers; no prices available.

Price basis to dealers: Undivided dealers get dealer price, less 0.5c.

Price basis to commercial consumers: Effective May 15, 1937, thru territory; commercial consumers taking 50 gals. or more at one time will be billed at posted consumer t.w. price; those taking less than 50 gals. at one time will be billed at 4c per gal. over posted consumer t.w. price. Generally, the posted consumer t.w. price will be equivalent to the dealer price less 0.5c per gal.

Humble Oil & Refining Co.

HUMBLE MOTOR FUEL

	T.W.	Taxes	Total T.W.	S.S.	Kerosine T.W.
Dallas, Tex.	8.5	5	13.5	17	8
Ft. Worth, Tex.	8.5	5	13.5	17	8
Houston, Tex.	9.5	5	14.5	18.5	8
San Antonio, Tex.	8.5	5	13.5	17	8

U. S. Motor Gasoline
(Third Grade)

Dallas, Tex.	7	5	12	14
Ft. Worth, Tex.	7	5	12	14
Houston, Tex.	8.5	5	13.5	16.5
San Antonio, Tex.	7	5	12	14

Price is t.w. price to all classes of dealers and consumers.

Price basis to dealers: to contract dealers consumer accounts off posted retail price: when posted retail price, including all taxes on Esso motor fuel is: 19.1c per gal. and above discount is 4c; 19c to 18.1c, 3.5c, and 18c and below, 3c. Humble motor fuel, 17.1c and above, 4c; 17 to 16.1c, 3.5c; and 16c and below, 3c; U. S. motor fuel, 15.1c and above, 3c; 15 to 14.1c, 2.5c; and 14c and below, 2c.

Continental Oil

	Conoco Bronze Ex-Tax	All Tax	Total Conoco T.W.	Bronze T.W.	Dealer Demand T.W.	Kerosine T.W.
Denver, Colo.	12.5	5	17.5	16.5		11.5
Grand Junc., Colo.	15	5	20	19		15
Pueblo, Wyo.	11	5	16	15		10.5
Casper, Wyo.	13	5	18	17		11.5
Cheyenne, Wyo.	13	5	18	17		13
Billings, Mont.	14	6	21	18		15.5
Butte, Mont.	13.5	6	19.5	16.5		15.5
Great Falls, Mont.	15.5	6	21.5	20.5		15.5
Helena, Mont.	15.5	6	21.5	20.5		15.5
Salt Lake City, Utah.	14.5	5	19.5	16.5		16
Boise, Ida.	15.5	6	21.5	20.5		18
Twin Falls, Ida.	15.5	6	21.5	20.5		18
Albuquerque, N. M.	11	†6.5	17.5	16.5		12
Roswell, N. M.	12	†6.5	18.5	15		10.5
Santa Fe, N. M.	13	*7	20	16.5		12
Muskogee, Okla.	10	5	15	13		7
Oklahoma City, Okla.	9	5	14	11		8
Tulsa, Okla.	9	5	14	11		6
Ft. Smith, Ark.	10.5	5	15.5	13.5		8
Little Rock, Ark.	10.5	7.5	18	15.125		9.5
Texarkana, Ark.	10.5	5	15.5	12.5		8.5

†Includes city tax of 0.5c.
*Includes 1c city tax.

S. O. California

STANDARD GASOLINE

	T.W.	Taxes	Total T.W.	S.S.	Kerosine T.W.
San Francisco, Cal.	13.5	4	17.5	18.5	11.5
Los Angeles, Cal.	13	4	17	18	9
Fresno, Cal.	14.5	4	18.5	19.5	12
Phoenix, Ariz.	15	6	21	22	†16
Reno, Nev.	15	5	20	21	13
Portland, Ore.	14	6	20	21	13.5
Seattle, Wash.	14	6	20	21	13.5
Spokane, Wash.	17	6	23	24	16.5
Tacoma, Wash.	14	6	20	21	13.5

FLIGHT GASOLINE
(Third Grade)

San Francisco, Cal.	12	4	16	17	....
Los Angeles, Cal.	11.5	4	15.5	16.5	....
Fresno, Cal.	13	4	17	18	....
Reno, Nev.	13.5	5	18.5	19.5	....
Phoenix, Ariz.	13.5	6	19.5	20.5	....
Portland, Ore.	12.5	6	18.5	19.5	....
Seattle, Wash.	12.5	6	18.5	19.5	....
Spokane, Wash.	15.5	6	21.5	22.5	....
Tacoma, Wash.	12.5	6	18.5	19.5	....

†Includes 5c state tax.

Discount to dealers: on gasoline, off t.w. price on Standard Ethyl and Standard Gasoline, to 100% dealers, 3c; to split dealers, 2c; on Flight gasoline, both 100% and split dealers, 2c.

On Stanavo Aviation Gasoline, to all classes of dealers, 3c off t.w.

To commercial consumers: off tank wagon price: on single deliveries of 40 gallons and over, Stanavo Aviation, Standard Ethyl and Standard Gasolines, 3c. Flight Gasoline, 2c per gallon. Tank wagon delivery, less than 40 gals., 1c per gal. above posted t.w. price.

On kerosine in tank car, transport truck and trailer delivery, 3c off t.w. price; plant deliveries to jobbers, 2.5c below t.w.

Canada

PRICES OF IMPERIAL OIL LTD.

Per Imperial Gallon, which is 1.2 U. S. Gallons

3-STAR IMPERIAL GASOLINE

	T.W.	Taxes	Total T.W.	Kerosine T.W.
Hamilton, Ont.	16	6	22	17
Toronto, Ont.	16	6	22	17
Brandon, Man.	22.8	7	29.8	22.3
Winnipeg, Man.	20.5	7	27.5	20.7
Regina, Sask.	22.5	7	29.5	22
Saskatoon, Sask.	25.3	7	32.3	24.8
Edmonton, Alta.	22.5	7	29.5	24.2
Calgary, Alta.	20	7	27	21.5
Vancouver, B. C.	16	7	23	23
Montreal, Que.	15	6	21	17.5
St. John, N. B.	16	8	24	18.5
Halifax, N. S.	16	8	24	18.5

Note: Imperial Oil Ltd. has completed transfer of service stations to dealers; no s.s. prices available.

Discounts to undivided dealers, 1c off t.w price, except Maritime Provinces where undivided dealers pay t.w. price. Divided dealers pay t.w. price, thru territory.

Aviation Gasoline

Following are tank car and/or tank wagon prices of aviation gasoline in principal marketing territories (Stanavo aviation in all territories except Continental Oil and unless otherwise noted). Tax column includes 1c federal tax, and state tax; also municipal taxes as indicated in footnotes. Prices in first four territories do not include state or federal taxes.

S. O. NEW JERSEY

	*Ethyl T.C.	Tank Car	T.W.
Bayonne, N. J.	19.5	9.5	12.5
Baltimore, Md.	....	10	12.5
Washington, D. C.	....	....	13.1
Richmond, Va.	....	....	15.2
Greensboro, N. C.	....	....	15.7
Raleigh, N. C.	....	....	17.1
Charleston, W. Va.	....	....	15.2

*This is Stanavo Ethyl Aviation Gasoline 100 octane number, tank car price.

COLONIAL BEACON OIL CO.

	T.W.
Brooklyn, N. Y.	12.8
Buffalo, N. Y.	14.1
Boston, Mass.	15

S. O. PENNSYLVANIA

Philadelphia, Pa.	12.8
Pittsburgh, Pa.	13.1

S. O. LOUISIANA

New Orleans, La.	13.8
Shreveport, La.	14.1

Prices in above four territories are on a 74 octane grade aviation gasoline except where otherwise noted. An 80 octane product generally brings 0.5c premium and an 87 octane product, 1.5c premium over the 74 octane grade.

Note: S.s. prices in above four territories are generally 6c over t.w. prices. Above t.w. prices are net, with no discounts allowed for quantity purchases. T.W. prices are generally tank car price, plus freight, plus 2.5c per gal.

S. O. OHIO
Thru Ohio

	Consumer T.W.	Tax	Total Consumer T.W.
Stanavo Ethy Aviation:			
73 octane	15.5	5	20.5
80 octane	16.5	5	21.5
87 octane	17.5	5	22.5

Discounts: For delivery on contract to hangar operators and resellers: 2c below consumer posted t.w. price, shown above.

S. O. INDIANA

Chicago, Ill.	14.5	4	18.5
Detroit, Mich.	16	4	20
Milwaukee, Wisc.	14.8	5	19.8
Minneapolis, Minn.	14.9	5	19.9
St. Louis, Mo.	14.7	*3	17.7
Kansas City, Mo.	14.4	*4	18.4
Fargo, N. D.	16.4	4	20.4
Huron, S. D.	15.3	5	20.3

*Includes 1c city tax.
**Includes 0.1c to cover.

HUMBLE OIL & REFINING CO.

	Tank Car
Baytown, Tex. (exclusive of taxes)	8.5

CONTINENTAL OIL CO.

	Dealer	Tax	Total Dealer
Denver, Colo.	15.5	5	20.5
Cheyenne, Wyo.	16	5	21
Helena, Mont.	18.5	6	24.5
Salt Lake City, Utah.	17.5	5	22.5
Albuquerque, N. M.	14	*6.5	20.5

*Includes city tax of 0.5c.

S. O. CALIFORNIA

Phoenix, Ariz.	17	6	23
Los Angeles, Cal.	15	4	19
San Francisco, Cal.	15.5	4	19.5
Reno, Nev.	17	5	22
Portland, Ore.	16	6	22
Seattle, Wash.	16	6	22
Spokane, Wash.	19	6	25

Note: For discounts, etc., see note under Standard and Flight gasoline above.

Eight-State Conference Of A. P. I. C. Leaders

NEW YORK—A four-day conference of Petroleum Industries Committee chairmen and secretaries of eight states and the District of Columbia—Delaware, Maryland, New Jersey, North Carolina, Ohio, Pennsylvania, Virginia and West Virginia, was held Sept. 21st to 24th, at the offices of the American Petroleum Industries Committee.

In the photograph of the group are: (Seated) D. M. McBride, chairman, Nebraska Petroleum Industries Committee; S. G. Sparger, secretary, North Carolina; C. M. Byers, chairman, North Carolina; E. J. Leary, secretary, New Jersey; F. V. Lowden, chairman, New Jersey; J. P. Lanigan, secretary, Maryland; P. S. Cochran, chairman, Maryland; Mrs. M. C. Mallon, secretary, District of Columbia Petroleum Association; B. D. Friedman, chairman, District of Columbia Petroleum Association; John H. Bivins, Jr., assistant to the director, American Petroleum Industries Committee; H. H. Hahn, secretary, Nebraska Committee; Baird H. Markham, director, American Petroleum Industries Committee; Ferd Townsend, of Mayville, Mo.; G. C. Lloyd, secretary, Iowa Committee; Wendell Stephens, chairman, Ohio; J. L. Marsh, secretary, Ohio; H. V. Daniel, vice-chairman, Pennsylvania; W. P. Taylor, secretary, Pennsylvania; Harry Botsford, press representative of Pennsylvania committee; F. H. Skehan, chairman, Virginia Committee; E. A. Kyhn, secretary, Virginia; W. A. Jackley, chairman, West Virginia; E. F. Patrick, secretary, West Virginia; and J. R. Schroeder, secretary, Minnesota.

Standing, left to right, are: (All members of APIC staff, unless otherwise noted.) E. T. Marten; H. P. Quadland; Beekman Aitken; A. W. Bowser; H. E. Sindall; C. S. Lee; V. A. Leslie; Grady H. Forgy; H. B. Galloway; T. J. Quinn; Victor H. Scales; Maurice Wyss (API); O. M. Thompson; A. P. Delahunt; John Gren (National Highway Users Conference); Adam Rumoshowski; and Cal Lewis.

TANK WAGON MARKETS

Tax column includes 1c federal tax, state gasoline tax, also city and county taxes as indicated in footnotes, and inspection fees, as shown in general footnote. These prices in effect Oct. 4, 1937, as posted by principal marketing companies at their headquarters offices, but subject to later corrections

Naphtha (In Tank Wagon)

S. O. NEW JERSEY

Posted Tank Wagon Prices

	Mineral Spirits	V.M.&P.
Newark, N. J.	12.5	15.5
Baltimore, Md.	15.5	....
Washington, D. C.	15	....

Discounts: Buyers taking following quantities, at one time, get these discounts: Newark, 2c per gal. on 200 gals. or more; less than 200 gals., 0.5c higher price. Baltimore 2c off on 25 to 100 gals. and 3c on over 100 gals. Washington, 2c off to contract buyers.

SOCONY-VACUUM OIL CO.

Buffalo, N. Y.	13	14
New York City	10.5	11.5
Rochester, N. Y.	12	15
Syracuse, N. Y.	14	15
Boston, Mass.	13.5	14
Bridgeport, Conn.	12.5	14
Hartford, Conn.	12	13.5
Providence, R. I.	13.5	14.5

ATLANTIC REFINING CO.

Philadelphia, Pa.	11.5	12.5
Lancaster, Pa.	13	14
Pittsburgh, Pa.	12.5	14.5

Note: Prices for Mineral Spirits also apply to Stoddard Solvent; and prices for V.M.&P. Naphtha apply also to Light Cleaners Naphtha.

S. O. OHIO

	S.R. Solvent	V.M.&P. Naphtha
Thru Ohio	13.25	13.75

Note: V.M.&P. Naphtha prices also apply on Dry Cleaners naphtha and special Varnolene; Varnolene and Sohio Solvent 0.5c below these prices. Discounts to contract consumers, off t.w. price: 300 to 999 gals., 0.5c; 1,000 to 2,499 gals., 0.75c; 2,500 to 4,999 gals., 1c; 5,000 or more gals., 1.5c.

S. O. INDIANA

(Prices include state and federal taxes)

	Oleum Spirits	V.M.&P. Naphtha	Staniso
Chicago, Ill.	15.8	16.1	15.5
Detroit, Mich.	19.2	18.2	19.3
Kansas City, Mo.	14.4	15.4	14.4
St. Louis, Mo.	14.7	15.7	14.6
Milwaukee, Wis.	19.3	20.3	19.3
Minneapolis, Minn.	19.4	20.4	18

Note: Prices for V. M. & P. apply also to Light Cleaners Naphtha. All prices, with exception of Missouri points, include state tax. Prices shown are base prices, before discounts.

Naphtha (In Tank Cars)

In Tank Cars (F. o. b. refinery or seaboard terminal except Ohio, delivered price.)

	V.M.&P. Naphtha	Solvent
Baltimore	11	10
New York Harbor	10.5–11	9.5
Philadelphia district	11	10
Boston	10.5	10
Providence	10.5	10
Ohio points, delivered	9.75	*9.25

*This is on S.R. solvent.

Note: In Ohio, prices on D.C. naphtha and special Varnolene are same as V.M.&P.; on Varnolene and Sohio Solvent, prices are 0.5c less than on V.M.&P.

Latest Changes

From Sept. 28 to Oct. 4 inclusive. Dates and amounts of changes shown. See table for full current prices.

S. O. Ohio—Kerosine:
Gallia County, up 0.5c, Oct. 1.
Continental Oil—Demand:
Little Rock, dealer price cut 0.875c, Oct. 1.
Imperial Oil—3-Star Imperial:
Winnipeg, cut 0.7c, Sept. 28.

Aviation

S. O. Indiana:
Chicago, Milwaukee, Minneapolis and Huron, cut 0.5c, Oct. 1.
Detroit, cut 0.2c, Oct. 1.

Corrections

Notation of amount of change and dates not previously shown in table. Table in this issue is corrected to show these changes.

S. O. Kentucky—Crown and Kyso:
Atlanta, cut 1c, Sept. 20.
Kerosine:
Jacksonville should be 10c, since July 31. Miami should be 12c, up 0.5c, Sept. 2, instead up 2c as reported Sept. 22 issue, page 52.
Continental Oil—Kerosine:
Fort Smith, cut 2c, Sept. 25.

SEABOARD MARKETS, EXPORT AND COASTWISE

All prices on this page are publisher's opinion of open market quotations or sales, for spot shipment (10 to 15 days). In cargo markets, spot shipment is 90 days. Prices in cents per gallon, except heavy fuel oil in dollars per barrel, in tank car lots, f.o.b. refineries or seaboard terminals in districts designated, unless otherwise noted. Federal, state or municipal taxes not included. Prices quoted apply on products made from legally produced crude.

Eastern Domestic

(Inter-refinery and export prices not included.)

MOTOR GASOLINE

Prices Effective	Oct. 4	
District:	*60-64 Oct.	*65 Oct. & Above
N. Y. harbor	7.25 – 7.75	7.50 – 8.00
†N. Y. harbor	7.00 – 7.25	7.25 – 7.50
Philadelphia	7.25 – 7.50	7.50 – 7.75
Baltimore	7.25 – 7.75	7.50 – 8.00
Norfolk	7.50 – 7.75	7.75 – 8.00
Wilmington, N. C.	7.50 – 7.75	7.75 – 8.00
Charleston, S. C.	7.50 – 7.75	7.75 – 8.00
Savannah	7.25	7.50
Jacksonville	7.25	7.50
Portland	7.75	8.00
Boston	7.25 – 7.50	7.50 – 7.75
Providence	7.25 – 7.50	7.50 – 7.75

*Prices are nominal. †Barge lots.

WATER WHITE KEROSINE

District:			
N. Y. harbor	6.30	Charleston, S. C.	6.25
*N. Y. harbor	6.125–6.18	Savannah	6.25
Philadelphia	6.25	Jacksonville	6.25
Baltimore	6.25	Portland	6.75
Norfolk	6.25	Boston	6.40
Wilmington, N. C.	6.25	Providence	6.30 – 6.40

*Barge lots.

†FUEL OILS

	N. Y. harb.	N. Y. harb. barges
No. 1	6.30	6.125– 6.18
Nos. 2-3	5.25	5.125
No. 4	5.25	5.00 – 5.125
No. 5	$1.55 –$1.60	.....
No. 6	$1.35	.....

	Phila. dist.	Balt. dist.
No. 1	6.25	6.25
Nos. 2-3	5.00	5.25
No. 4	4.75 – 5.00	5.25
No. 5	$1.475	$1.55
No. 6	$1.30 –$1.35	$1.35

	Bost. dist.	Prov. dist.
No. 1	6.40	6.30 – 6.40
Nos. 2-3	5.40	5.40
No. 4	5.40	5.40
No. 5	$1.55 –$1.60	.....
No. 6	$1.35	.....

†Fuel oils meet specifications of U. S. Commercial Standards CS12-35.

District:	†Bunker C Fuel	†Diesel Oil
N. Y. harbor	***$1.35	**$2.20
Philadelphia	***$1.30–$1.35	***$2.20
Baltimore	***$1.35	**$2.20
Norfolk	*$1.35	$2.20
Charleston	$1.30	$2.20
Savannah	*$1.30	$2.20
Jacksonville	*$1.30	$2.20
Tampa	*$1.30	$2.20
Portland	$1.45	$2.35
Boston	***$1.35	**$2.25
Providence	$1.35	$2.25

†In ships' bunkers.
*For barging add 5c per bbl.
**For barging add 6.5c to 7.5c per bbl.
***For barging add 5c to 6c per bbl.

	Gas Oil 28-34 Gravity	Diesel Oil Shore Plants
N. Y. harbor	5.25	5.25
Philadelphia dist.	5.00	....
Baltimore dist.	5.25	....
Norfolk dist.	5.25	....
Savannah dist.	....	5.25
Jacksonville dist.	....	5.25

Pacific Export

(Quotations are at seaboard, Los Angeles, in cargo lots, cents per gal., except where otherwise noted.)

Prices Effective	Oct. 4	Sept. 27
U. S. Motor, under 65 oct.	6.00 – 6.125	6.00 – 6.125
400 e.p. blend 65 oct. & above	6.125– 6.375	6.375– 6.50
*38-40 w.w. kerosine	4.50 – 4.75	4.50 – 4.75
41-43 w.w. kerosine	4.75 – 5.00	4.75 – 5.00
44 w.w. kerosine	5.00	5.00

*150 fire point.

Prices Effective	Oct. 4	Sept. 27
In Cargo lots, per bbl.		
Diesel fuel, 24° & above	$1.40 –$1.45	$1.40 –$1.45
Diesel fuel, under 24°	$1.30 –$1.35	$1.30 –$1.35
*30-34 diesel (gas oil)	$1.45 –$1.50	$1.45 –$1.50
†Grade C fuel oil	$0.85	$0.85 –$1.05

Note: For San Francisco cargo prices, add 5c per bbl. to above cargo prices.

In Ships' Bunkers, or deep tank lots, per bbl.:		
*Diesel fuel oil	$1.625–$1.65	$1.625–$1.65
†Grade C fuel oil	$1.075–$1.10	$1.075–$1.10

*Pacific specification 200. †Pacific specification 400.

Cased Goods: (Per case)		
U. S. Motor	$1.40 –$1.525	$1.40 –$1.525
400 e.p. blend, 65 oct. & above	$1.50 –$1.625	$1.50 –$1.625
*40-43 w.w. kerosine	$1.25 –$1.325	$1.25 –$1.325
Kerosine, p.w.	$1.20 –$1.30	$1.20 –$1.30

*150 fire point.

New York Export

(Prices in cents per gal. in bbls. F.a.s. New York)

CYLINDER OILS (Pennsylvania Products)

Bright stock:		
Light, 25 p.t.	25.50 –26.00	25.50 –26.00
Dark, 25 p.t.	25.00 –25.50	25.00 –25.50
Neutral oil:		
200 3 color, 25 p.t.	32.00 –32.50	32.00 –32.50
150 3 color, 25 p.t.	27.50 –28.00	27.50 –28.00
600 Warren E filtered	23.00 –23.50	24.00 –24.50
600 s.r., unfiltered	18.75 –19.25	20.25 –20.75
650 s.r., unfiltered	22.50 –23.00	24.00 –24.50
600 fl., s.r.	24.00 –24.50	25.00 –25.50
630 fl., s.r.	28.00 –28.50	29.00 –29.50

Wax, Domestic *and* Export

(Prices in cents per lb. Tests made by A. S. T. M. methods. Melting points shown below, however, are A. M. P., 3° higher than A. S. T. M. (E. M. P.) melting points. Export prices are f.a.s. carload lots. Domestic prices are f.o.b. refineries in New York and New Orleans districts, in bags, carload lots, with 0.2c discount allowed for shipment in bulk. Scale, solid and fully refined, slabs in bags.)

Prices Effective	Oct. 4	
	New York	
	Domestic	Export
124-6 Y.C. scale	2.85	2.85
122-4 W.C. scale	2.90 – 2.95	2.90 – 2.95
124-6 W.C. scale	2.90 – 2.95	2.90 – 2.95
123-5 Fully rfd.	4.45	4.375
125-7 Fully rfd.	4.55	4.50
128-30 Fully rfd.	4.80	4.75
130-2 Fully rfd.	5.05	5.00
133-5 Fully rfd.	†5.50	5.50
135-7 Fully rfd.	†5.75	5.75
	New Orleans	
	Domestic	Export
124-6 Y.C. scale	2.85	2.85
122-4 W.C. scale	2.95	2.95
124-6 W.C. scale	2.95	2.95
123-5 Fully rfd.	4.45	4.375
125-7 Fully rfd.	4.55	4.50
128-30 Fully rfd.	4.80	4.75
130-2 Fully rfd.	5.05	5.00
133-5 Fully rfd.	†5.50	5.50

†Shipment either in bags or in bulk.

Gulf Coast

(Prices are f.o.b. ship at Gulf oil terminals representing opinions of traders, except prices specified to the contrary. Prices cover bulk shipments of 20,000 bbls. or more, unless otherwise noted.)

Prices Effective	Oct. 4	Sept. 27
For Domestic shipment:		
MOTOR GASOLINE		
59 oct. & below	*6.00	*6.00 – 6.125
60-64 oct. number	*6.125– 6.25	*6.25
65 oct. & above	6.375– 6.50	6.50
FUEL OILS		
No. 1	5.25 – 5.375	5.25
No. 2	4.50	4.50
No. 4	4.25	4.25
KEROSINE		
41-43 w.w.	5.25 – 5.375	5.25
For Export Shipment:		
GASOLINE		
U. S. Motor	6.00	6.00 – 6.125
60-62, 400 e.p.	6.125	6.125– 6.25
61-63, 390 e.p.	6.125	6.125– 6.25
64-66, 375 e.p.	6.25	6.25 – 6.375

*Nominal.

Prices Effective	Oct. 4	Sept. 27
KEROSINE		
44 w.w.	5.50	5.50
41-43 w.w.	5.25 – 5.375	5.25
41-43 p.w.	5.125– 5.25	5.125
GAS AND BUNKER OILS		
For Domestic and/or Export Shipment		
‡26-30 translucent gas oil	4.25	4.25
‡30 plus translucent gas oil	4.50	4.50
‡30 plus transparent gas oil	4.50	4.50
Diesel Oil Ship's bkrs.	†$1.90	†$1.90
Grade C bunker oil, for ship's bunkers	†$1.05	†$1.05
Grade C bunker oil, in cargoes	$0.85 –$0.875	$0.875–$0.90

‡Less than ½ of 1% sulphur. †Barging 5c bbl. additional at some Gulf ports.

MEXICAN CRUDE AND BUNKER OILS

(F.o.b. Steamer, Tampico)

Heavy Panuco crude, taxes to be paid	*$1.05 –$1.10	*$1.10
Grade C bunker oil, ship's bunkers, taxes paid	$1.05	$1.05

MID-CONTINENT LUBRICATING OILS

(Prices in cents per gal. in bbls. f.a.s. Gulf oil terminals. In drums and new barrels, 0.5c to 1c higher per gal. in some instances.)

190-200 vis. D 210 brt. stock	25.50	25.50
150-160 vis. D 210 brt. stock:		
0-10 p.p.	22.50	22.50
10-25 p.p.	22.00	22.00
25-40 p.p.	21.50	21.50
150-160 vis. E 210 brt. stock	21.50	21.50
120 vis. D 210 brt. stock	20.50	20.50
180 vis. No. 3 color neutral:		
0-10 p.p.	16.50	16.50
15-30 p.p.	16.00	16.00
200 vis. No. 3 color neutral:		
0-10 p.p.	17.00	17.00
15-30 p.p.	16.50	16.50
600 s.r. olive green	12.50	12.50
600 s.r. dark green	11.00	11.00
631 s.r.	22.00	22.00

SOUTH TEXAS LUBRICATING OILS

(Vis. at 100° F., pour point 0. Tanker, f.o.b. Gulf oil terminals, for export shipment.)

Unfiltered Pale Oils:			
Vis.	Color		
100	No. 3	5.50 – 5.75	5.50 – 5.75
200	No. 3	7.25 – 7.50	7.25 – 7.50
300	No. 3	7.75 – 8.00	7.75 – 8.00
500	No. 3½	8.75 – 9.00	8.50 – 8.75
750	No. 4	9.25 – 9.50	9.25 – 9.50
1200	No. 4	9.75 –10.00	9.75 –10.00
2000	No. 4	10.25 –10.50	10.25 –10.50
Red Oils:			
Vis.	Color		
100	No. 5-6	5.50 – 5.75	5.50 – 5.75
200	No. 5-6	7.25 – 7.50	7.25 – 7.50
300	No. 5-6	7.75 – 8.00	7.75 – 8.00
500	No. 5-6	8.75 – 9.00	8.50 – 8.75
750	No. 5-6	9.25 – 9.50	9.25 – 9.50
1200	No. 5-6	9.75 –10.00	9.75 –10.00
2000	No. 5-6	10.25 –10.50	10.25 –10.50

Note: Red oil prices shown above cover oils with green cast; prices for blue cast red oils are slightly lower in some cases.

Tanker Rates

(Approximate tanker freight rates to Continental ports, in shillings per ton of 2240 lbs., British sterling; to U. S. ports in cents per bbl.)

Rates Effective Oct. 4

	Crude &/or Fuel		Refined Oil &/or Spirits	
	Last Paid	Owners Ask	Last Paid	Owners Ask
Gulf-U.K./Cont.‡	25/	25/6-26/	25/6	26/-27/
Aruba-U.K./Cont.‡	21/6	21/6-22/6	22/	23/-24/
Gulf-N. Atlantic** (not E. of N. Y.):				
Hvy. Crude & Fuel, (10 to 19.9 gravity)	32c	32c-33c	....	....
Light Crude, (30 Grav. or Lighter)	28c	28c-29c	....	....
Gasoline	....	....	32c	31c-32c
Kerosine	....	....	33c	32c-33c
Light Fuel	....	....	34c	33c-34c

Note: Dirty boat quotations are enlarged to cover, "Fuel and Light Crude" quotations.

‡Continental ports in range between Bordeaux and Hamburg, both inclusive.

**Venezuela loading same rate; Tampico 2c to 3c per bbl. additional.

*Nominal.

CRUDE OIL MARKETS

Prices in $ per bbl. of 42 U. S. gals. at the well. A. P. I. gravity. Prices are effective as of 7 a. m. of dates as given

EASTERN FIELDS

Posted by Joseph Seep Purchasing Agency

(Effective Sept. 1, 1937, except Corning Sept. 2, 1937)

Penna. Grade Oil in Southwest Penna. Pipe Lines.....$2.30
Penna. Grade Oil in Eureka Pipe Lines (West Virginia).....$2.25
Penna. Grade Oil in Buckeye Pipe Lines (Macksburg, O.).....$2.10
Corning Oil in Buckeye Pipe Lines (Ohio)...$1.27

Posted by Other Companies

Tide Water Pipe Co., Ltd.
Bradford-Allegany district (Penna. and N. Y.) (Effective Sept. 1, 1937).....$2.60
*The Pennzoil Co.: (Effective Sept. 1, 1937)
Penna. Grade Oil in National Transit Lines*$2.60
Ashland Oil & Transportation Co.:
Somerset Oil in Ashland Lines (Ky.):
(Effective Jan. 28, 1937)
Big Sandy River.....$1.42
Kentucky River.....$1.50

*The Pennzoil Co. posts $2.60 in Cochran, Franklin, Hamilton and Doolittle, Pa. fields; prices in other lower districts range down to $2.55 per bbl. at well.

MICHIGAN

Posted by Pure Oil Co.

Midland, Midland County (July 23, 1937)...$1.27

Posted by Simrall Pipe Line Corp.

(Effective July 22, 1937)
West Branch, Arenac, and equal grades.....$1.09
(Effective July 23, 1937)
Beaverton, Crystal, Greendale, Porter and equal grades.....$1.27
Buckeye.....$1.245
(Effective July 1, 1937)
Billings and Tobacco.....$1.395

CENTRAL STATES FIELDS

Posted by Ohio Oil Co.

(Effective Jan. 28, 1937)

Illinois, Princeton.....$1.35
Lima.....$1.25
Owensboro (Western Ky.).....$1 40

Posted by Stoll Oil Refining Co.

(Effective Feb. 1, 1937)

Stoll Pipe Line Oil (Ky.).....$1.40

CANADIAN FIELDS

Posted by Imperial Oil Limited

Western Ontario

(Effective Sept. 9, 1933)

Petrolia.....$2.10
Oil Springs.....$2.17

Alberta—Turner Valley

(Prices f.o.b. field tankage)
(Effective Sept. 1, 1937)

Clear Naphtha, 65 grav. & above.....$2.36

Crude Oil & Discolored Naphtha

40-40.9°	$1.36	53-53.9	$1.62
41-41.9	1.38	54-54.9	1.64
42-42.9	1.40	55-55.9	1.66
43-43.9	1.42	56-56.9	1.68
44-44.9	1.44	57-57.9	1.70
45-45.9	1.46	58-58.9	1.72
46-46.9	1.48	59-59.9	1.74
47-47.9	1.50	60-60.9	1.76
48-48.9	1.52	61-61.9	1.78
49-49.9	1.54	62-62.9	1.80
50-50.9	1.56	63-63.9	1.82
51-51.9	1.58	64-64.9	1.84
52-52.9	1.60	65° & higher, for discolored naphtha only	2.36

Note: Clear naphtha: 22 color; 10 lbs. vapor pressure, Reid method; 90% recovery; end point, 410°. Discolored naphtha: same specifications as for clear naphtha except color.

MID-CONTINENT

Posted by Stanolind Crude Oil Purchasing Co., Jan. 28, 1937

	(In Oklahoma-Kansas) *Kansas	(In North-North Central Texas)
Below 29	$1.06	$0 96
29-29.9	1.08	0 98
30-30.9	1.10	1.00
31-31.9	1.12	1 02
32-32.9	1.14	1.04
33-33.9	1.16	1.06
34-34.9	1.18	1.08
35-35.9	1.20	1.10
36-36.9	1.22	1.12
37-37.9	1.24	1.14
38-38.9	1.26	1.16
39-39.9	1.28	1.18
40 & above	1.30	1.20

Above Stanolind prices met as follows:

Jan. 28, Continental Oil Co. met in Okla., Kans., and North Texas. Sinclair-Prairie met in North Texas and North Central Texas, Jan. 28, Stanolind's North Texas schedule. Same date, The Texas Co. met in North-North Central Texas.

Note: Stanolind prices in Okla.-Kans. are for quantities computed by 97% tank tables. In Texas, 99% tank tables are used, volume corrected to 60° F., and deduction for full b.s. & w. content.

*Effective Aug. 1, 1937, for Otis-Albert pools Rush-Barton counties, Kans., 13c less.

Posted by Carter Oil Co.

In Oklahoma

(Effective Jan. 28, 1937)

Below 25	$0.98	33-33.9	$1.16
25-25.9	1.00	34-34.9	1.18
26-26.9	1.02	35-35.9	1.20
27-27.9	1.04	36-36.9	1.22
28-28.9	1.06	37-37.9	1.24
29-29.9	1.08	38-38.9	1.26
30-30.9	1.10	39-39.9	1.28
31-31.9	1.12	40 and above...	1.30
32-32.9	1.14		

Above Carter schedule met Jan. 28 by the following companies: Sinclair-Prairie, Shell and Barnsdall in Oklahoma-Kansas; Skelly Oil in Kansas; Tide Water in Oklahoma; Pure Oil in Oklahoma-Kansas, beginning with below 24 at $0.98 and ending with 40 & above at $1.30.

Posted by Magnolia Petroleum Co.

(Effective Jan. 28, 1937)

In Oklahoma, same schedule as Carter Oil, which see above, beginning with below 25, at $0.98 and ending with 40 & above, at $1.30.

In Texas: North and North Central, including Burkburnett, Archer, Henrietta, Electra, Comanche and Olden, same gravity and price schedule as Stanolind in North Texas, which see under Stanolind, beginning with below 29 at $0.96 and ending with 40 and above, at $1.20.

Posted by Humble Oil & Refining Co.

TEXAS FIELDS

(**West Central Texas*)

(Effective Jan. 28, 1937)

Below 29	$0.96	35-35.9	$1.10
29-29.9	0.98	36-36.9	1.12
30-30.9	1.00	37-37.9	1.14
31-31.9	1.02	38-38.9	1.16
32-32.9	1.04	39-39.9	1.18
33-33.9	1.06	40 and above...	1.20
34-34.9	1.08		

*Includes Brown, Callahan, Coleman, Comanche, Eastland, Fisher, Haskell, Jones, Shackelford, Stephens, Throckmorton and Young counties.

Shell Petroleum Corp., effective Jan. 28, posts Humble's above schedule on Fisher county crude, plus these five lower grades, beginning with below 25 gravity at $0.88; 25-25.9, $0.90; 26-26.9, $0.92; 27-27.9, $0.94, and 28-28.9, $0.96; rest of schedule same as Humble's in West Central Texas.

†Effective Dec. 1, 1934, Humble prices are based on 99% tank tables at 60F. Allowance or deduction of 1% is made for each 25° change in temperature above or below 60F.

(**East Central Texas*)

(Effective Jan. 28, 1937)

Below 29	$1.03	35-35.9	$1.17
29-29.9	1.05	36-36.9	1.19
30-30.9	1.07	37-37.9	1.21
31-31.9	1.09	38-38.9	1.23
32-32.9	1.11	39-39.9	1.25
33-33.9	1.13	40 and above...	1.27
34-34.9	1.15		

*Including Anderson, Cherokee, Limestone, Navarro counties.

Same date, Sinclair-Prairie met in Mexia Humble's above schedule.

PANHANDLE TEXAS

Posted by Humble Oil & Refining Co.

(Effective Jan. 28, 1937)

	Gray County	Carson-Hutchinson
Below 35	$0.96	$0.91
35-35.9	0.98	0.93
36-36.9	1.00	0.95
37-37.9	1.02	0.97
38-38.9	1.04	0.99
39-39.9	1.06	1.01
40 & above	1.08	1.03

Jan. 28, above prices met by Sinclair-Prairie and Magnolia in the entire area and by Continental in Carson-Hutchinson and by Texas Co. in Panhandle Sweet, same as Humble's Gray Co. and on Panhandle Sour, same as Carson-Hutchinson.

EAST TEXAS

(Effective May 22, 1937)

Stanolind, Humble, Shell, Sinclair-Prairie, Texas Co., and Magnolia.....$1.35

Shell also posted on Jan. 28, in Livingston area, Polk County, Texas, $1.27.

NORTHEAST TEXAS

(Posted by Humble, Jan. 28, 1937)

Talco.....$0.73

(Posted by Magnolia, Jan. 28, 1937)

Cass County and Panola County, Tex:
Same gravity and price schedule as S. O. Louisiana posts for Rodessa, La., which see under that company.

(*Posted by The Texas Co., Jan. 28, 1937*)

Cass County.....$1.25

WEST TEXAS AND NEW MEXICO

Posted by Humble Oil & Refining Co.

(Effective Jan. 28, 1937)

(Including Andrews, Crane, Crockett, Ector, Glasscock, Howard, Winkler and Upton Counties, Texas and Lea county, New Mexico).

Below 26	$0.78	33-33.9	$0.94
26-26.9	0.80	34-34.9	0.96
27-27.9	0.82	35-35.9	0.98
28-28.9	0.84	36-36.9	1 00
29-29.9	0.86	37-37.9	1.02
30-30.9	0.88	38-38.9	1.04
31-31.9	0.90	39-39.9	1.06
32-32.9	0.92	40 & above	1.08

Pecos, West Texas.....$0.91

Jan. 28, Magnolia met Humble in Crane, Upton, Howard, Glasscock, Mitchell and Winker.

Shell Petroleum Corp., on Jan. 28, met Humble in Crane, Glasscock, Howard, Pecos (except Yates shallow pool), Winkler, and Upton counties, Tex., and in Lea County, N. Mex. On Jan. 28, Shell posted in Yates shallow pool in Pecos county, Tex., $0.81. June 4, 1937, Shell added Ector county to West Texas postings.

Jan. 28, Stanolind Oil & Gas Co. met Humble in Hendrick field, Winkler county.

Jan. 28, Texas Co. met Humble in Ward and Winkler counties, Tex., and Lea County, N. M.

April 20, 1937, Sinclair Prairie met Humble in Ward and Winkler, Tex. and Lea, N. M., counties, except that its gravity schedule ends with 36 and above, at $1.00.

Posted by Continental Oil Co.

(Effective Jan. 28, 1937)

Artesia, Jackson and Maljamar pools, N. M...$0.90

COLORADO

(Posted by Continental Oil Co., Effective Jan. 28, 1937)

Ft. Collins and Wellington

Below 29	$1.01	35-35.9	$1.15
29-29.9	1.03	36-36.9	1.17
30-30.9	1.05	37-37.9	1.19
31-31.9	1.07	38-38.9	1.21
32-32.9	1.09	39-39.9	1.23
33-33.9	1.11	40 & above	1.25
34-34.9	1.13		

Cannon City and Florence, Col.....$1.10

SOUTH AND SOUTHWEST TEXAS

Posted by Humble Oil & Refining Co.

(Effective Jan. 28, 1937)

Carroll, Clark, Darst Creek, Hilbig, Salt Flat and Zoboroski fields.....$1.09
Pettus.....$1.37 Van Zandt.....$1.10

(Effective Nov. 1, 1936)

Heyser heavy...$0.90 Placedo heavy..$0.90
Heyser light..... 1.15 Taft..... 0.95

Shell Pet. Corp. on Jan. 28, posted $1.09 in Salt Flat district, Tex.

Anahuac, Dickinson, Flour Bluff and Turtlebay

(Effective Jan. 28, 1937)

Below 31	$1.16	36-36.9	$1.28
31-31.9	1.18	37-37.9	1.30
32-32.9	1.20	38-38.9	1.32
33-33.9	1.22	39-39.9	1.34
34-34.9	1.24	40 and above...	1.36
35-35.9	1.26		

Jan. 28, Magnolia met Humble in Darst Creek; posted $1.00 in Luling; $1.12 in Lytton Springs; $1.27 for Cleveland, Liberty county, Tex.; $1.15 in Hardin, Liberty county. Tex.

Jan. 28, 1937, The Texas Co. met Humble in Darst Creek.

Posted by Humble

Conroe, Raccoon Bend, Tomball and Satsuma
(Deep sand crudes)
(Effective Jan. 28, 1937)

Below 29	$1.20	35-35.9	$1.34
29-29.9	1.22	36-36.9	1.36
30-30.9	1.24	37-37.9	1.38
31-31.9	1.26	38-38.9	1.40
32-32.9	1.28	39-39.9	1.42
33-33.9	1.30	40 & above	1.44
34-34.9	1.32		

Jan. 28, Magnolia met Humble in Tomball and Texas Co. met Humble in Conroe, beginning with 35-35.9 gravity.

Posted by Humble

Mirando, Heavy and Light
(Effective July 6, 1937)

Below 21	$0.96	31-31.9	$1.18
21-21.9	0.98	32-32.9	1.20
22-22.9	1.00	33-33.9	1.22
23-23.9	1.02	34-34.9	1.24
24-24.9	1.04	35-35.9	1.26
25-25.9	1.06	36-36.9	1.28
26-26.9	1.08	37-37.9	1.30
27-27.9	1.10	38-38.9	1.32
28-28.9	1.12	39-39.9	1.34
29-29.9	1.14	40 & above	1.36
30-30.9	1.16		

July 6, Magnolia posted same schedule as Humble in Mirando.

July 6, 1937, Texas Co. posted for Duval-Mirando, $0.96 for below 21, plus 2c differential, to $1.12 for 28 & above.

(*Continued on next page*)

CRUDE OIL MARKETS

(Continued from preceding page)

NORTH LOUISIANA-ARKANSAS

Posted by Standard Oil Co. of Louisiana

(Effective Jan. 28, 1937)

(In Caddo, Homer, Haynesville, Sabine, De Soto, Sarepta, Carterville, El Dorado, Bunkie, and Miller county).

Below 25	$0.90	33-33.9	$1.08
25-25.9	0.92	34-34.9	1.10
26-26.9	0.94	35-35.9	1.12
27-27.9	0.96	36-36.9	1.14
28-28.9	0.98	37-37.9	1.16
29-29.9	1.00	38-38.9	1.18
30-30.9	1.02	39-39.9	1.20
31-31.9	1.04	40 and above	1.22
32-32.9	1.06		

Rodessa, La.

(Effective Jan. 28, 1937)

Below 25	$0.93	33-33.9	$1.11
25-25.9	0.95	34-34.9	1.13
26-26.9	0.97	35-35.9	1.15
27-27.9	0.99	36-36.9	1.17
28-28.9	1.01	37-37.9	1.19
29-29.9	1.03	38-38.9	1.21
30-30.9	1.05	39-39.9	1.23
31-31.9	1.07	40 and above	1.25
32-32.9	1.09		

Choctaw and Darrow

Jan. 28, 1937, initial posting; same schedule as Humble posts in Mirando, Tex., which see.

Smackover, Ark	$0.90
Urania, La. (La. Oil Refg. Co., Jan. 10, '36)	0.97
Tepetate, La. (Continental Oil, Jan. 28, '37)	1.24

Jan. 28, 1937, Magnolia met S. O. La.'s No. La.-Ark. gravity and price schedule in Pine Island, Haynesville, Bull Bayou and Cotton Valley, La., and in Eldorado and Rainbow districts, Ark.; and met S. O. La.'s Rodessa prices; and in Lockport, Iowa, Cameron Meadow, La., posted Humble's gravity and price schedule on Mirando.

Jan. 28, The Texas Co. met S. O. La. in N. La., except that its gravity schedule begins with below 27 at $0.94. It posted $1.37 for Garden Island, La., $1.24 for LaFitte, La. and $0.90 for Smackover.

*GULF COASTAL FIELDS

Posted by Humble Oil & Refining Co. and The Texas Co.

	(Effective Jan. 28, 1937) Humble	Texas	Saxet (Humble) (July 6 '37)
Below 18	$0.95	$0.90	....
18-18.9	for	0.92	....
19-19.9	below	0.94	....
20-20.9	21°	0.96	$1.01
21-21.9	0.98	0.98	1.03
22-22.9	1.01	1.01	1.05
23-23.9	1.04	1.04	1.07
24-24.9	1.07	1.07	1.09
25-25.9	1.10	1.10	1.11
26-26.9	1.13	1.13	1.13
27-27.9	1.15	1.15	1.15
28-28.9	1.17	1.17	1.17
29-29.9	1.19	1.19	1.19
30-30.9	1.21	1.21	1.21
31-31.9	1.23	1.23	1.23
32-32.9	1.25	1.25	1.25
33-33.9	1.27	1.27	1.27
34-34.9	1.29	1.29	1.29
35-35.9	1.31	for	1.31
36-36.9	1.33	oil	1.33
37-37.9	1.35	34°	1.35
38-38.9	1.37	and	1.37
39-39.9	1.39	above.	1.39
40 and above..	1.41	....	1.41

Effective Dec. 1, 1934, Humble prices are based on 99% tank tables at 60F. Allowance or deduction of 1% is made for each 25° change in temperature above or below 60F.

*Includes these fields: Barbers Hill, Goose Creek, Hull, Humble, Liberty, Moss Bluff, Mykawa, Orange, Pierce Junction, Plymouth, Rabbs Ridge, Raccoon Bend (shallow sand), Refugio light and †heavy, Sour Lake, Spindletop, Sugarland and West Columbia. †Except these grades of Refugio heavy: effective July 6, 1937: Below 20, $0.95; 20-20.9, $1.01; 21-21.9, $1.03; 22-22.9, $1.05; 23-23.9, $1.07; 24-24.9, $1.09; and 25-25.9, $1.11; rest of schedule same as other Gulf Coastal crude.

Jan. 28, Sinclair-Prairie met above Humble schedule in full.

July 6, 1937, The Texas Co. posted for Refugio: $1.01 for below 21, plus 2c differential, to $1.17 for 28 & above. On this same date, it also met Humble on Saxet, except that it pays $1.01 for oil below 21, and ends its schedule at 28-28.9 at $1.17.

ROCKY MOUNTAIN FIELDS

Posted by Stanolind Oil & Gas Co.

(Effective Jan. 28, 1937)

Salt Creek, Midway and Dutton Creek, Wyo., same schedule as Stanolind posts in Oklahoma, Kansas which see under Mid-Continent crude on previous page.

Greybull-Torchlight	$1.30
Iles, light, Col	1.18
Iles, heavy	1.12
Hogback, N. M.	1.33
Big Muddy	1.23
Elk Basin, light	1.30
Grass Creek, light	1.30
Frannie light	0.82

(Effective Nov. 4, 1936)

Grass Creek, heavy	$0.62
Frannie heavy	0.62
Hamilton Dome, Wyo	0.57

Pondera, Mont., (Postings discontinued July 1, 1936, but Stanolind pays price posted by Ohio Oil for Kevin-Sunburst, less 20c per bbl.)

Posted by Ohio Oil Co

(Effective Jan. 28, 1937)

Elk Basin, Wyo.	$1.30
Grass Creek, light	1.30
Rock Creek	1.205
Lance Creek	0.97
Sunburst, Mont.	1.20

Posted by *International Refg. Co.

Cut Bank, Mont.

(Effective Jan. 28, 1937)

Below 35°	$1.34	38-38.9	$1.42
35-35.9	1.36	39-39.9	1.44
36-36.9	1.38	40 and above	1.46
37-37.9	1.40		

*Texas Co. subsidiary.

Posted by Continental Oil Co.

(Effective Jan. 28, 1937)

Cat Creek, Mont.	$1.40
Big Muddy, Wyo.	1.18
Lance Creek, Wyo.	0.97

CALIFORNIA, *Posted by Standard Oil of California*

All gravities above those quoted take highest price offered in the field. Prices effective Feb. 26, 1936, except Huntington Beach, Playa del Rey, Santa Fe Springs, Kern Front, Signal Hill (Long Beach) effective March 7, 1936, and Elk Hills, effective June 22, 1936

Gravity	Signal Hill (Long Beach)	Seal Beach	Alamitos Heights	Huntington Beach	Inglewood	Playa del Rey	Olinda Brea Canon	Athens Rosecrans	Dominguez	Torrance	Richfield	Whittier East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	‡Newhall and others	Mountain View	Elk Hills	Buena Vista Hills **Midway-Sunset	Lakeview Area	Lost Hills	Coalinga	Wheeler Ridge
14-14.9	$0.80	0.79	0.74	0.78	0.79	0.80	0.76	....	....	0.80	0.76	0.76	0.77	0.78	....	0.70	....	0.70	0.70	0.65	0.70	0.70	....
15-15.9	.80	.79	.74	.78	.79	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	.65	.70	.70	....
16-16.9	.80	.79	.74	.78	.79	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	.65	.70	.70	....
17-17.9	.80	.79	.74	.78	.81	.80	.76	....	....	.80	.76	.76	.77	.78	....	.70	....	.70	.70	.65	.70	.70	....
18-18.9	.80	.79	.74	.78	.84	.80	.78	....	....	.82	.76	.76	.77	.78	....	.70	....	.70	.70	.65	.70	.70	....
19-19.9	.82	.79	.74	.82	.87	.84	.81	....	....	.85	.76	.78	.77	.78	....	.70	.70	.74	.74	.66	.74	.71	.70
20-20.9	.85	.79	.74	.85	.90	.88	.84	....	....	.88	.78	.82	.77	.80	....	.70	.78	.78	.78	.68	.78	.72	.70
21-21.9	.88	.79	.74	.89	.93	.93	.88	....	....	.91	.80	.85	.77	.84	.78	.78	.82	.82	.71	.82	.74	.70
22-22.9	.92	.82	.74	.92	.96	.98	.92	....	....	.93	.84	.89	.79	.88	.78	.77	.87	.87	.74	.86	.78	.72
23-23.9	.95	.86	.77	.96	.99	1.02	.96	.84	.79	.96	.88	.93	.82	.92	.78	.80	.92	.92	.77	.90	.82	.76
24-24.9	.99	.91	.80	1.00	1.02	1.06	.99	.88	.81	.99	.91	.96	.85	.96	.82	.84	.97	.97	.80	.94	.86	.79
25-25.9	1.03	.95	.82	1.03	1.05	1.11	1.03	.93	.83	1.02	.95	....	.89	.99	.86	.88	1.01	1.01	.83	.98	.90	.83
26-26.9	1.06	1.00	.85	1.07	1.09	1.16	1.06	.98	.86	1.05	.98	....	.92	1.03	.90	.91	1.06	1.06	.86	1.02	....	....
27-27.9	1.10	1.05	.88	1.11	1.12	....	1.10	1.03	.88	....	1.02	— —	.96	1.06	.95	.95	1.10	1.10	.88	1.06	....	....
28-28.9	1.14	1.10	.90	1.14	1.15	....	1.14	1.07	.90	....	1.06	....	.99	1.10	.99	.99	1.15	1.15	.91	1.10	....	....
29-29.9	1.17	1.15	.93	1.18	1.18		1.17	1.12	.93	....	1.09	....	1.03	1.14	1.03	1.02	1.20	1.20	.94	1.14	....	....
30-30.9	1.21	1.19	.95	1.22	1.21		1.21	1.17	.95	....	....	....	1.07	1.17	1.08	1.06	1.25	1.25	.97	1.18	....	....
31-31.9					1.24		1.24	1.22	.97	....	....	....	1.11	1.21	1.12	1.09	1.29	1.29	.99			
32-32.9		*Elwood Terrace			1.27		1.27	1.27	1.00	....	....	....	1.14	1.25	1.16	1.13	1.34	1.34	1.02	Kettleman Hills		
33-33.9	....	1.28	....	....	....		....	1.32	....	....	....	....	1.18	1.28	1.20	1.17	1.38	1.38	1.04	....	1.19	....
34-34.9	....	1.32	....	....	....		....	1.37	....	....	....	....	1.22	1.32	1.25	1.20	....	....	....	....	1.23	....
35-35.9	....	1.35	....	....	....		....	1.42	....	....	....	....	1.25	....	1.29	....	....	....	....	....	1.27	....
36-36.9	....	1.39	....	....	....		....	1.46	....	....	....	....	1.29	....	1.33	....	....	....	....	....	1.31	....
37-37.9	....	1.43	....	....	....		....	1.51	....	....	....	....	1.32	....	1.37	....	....	....	....	....	1.35	....
38-38.9	....	....	....	....	....		....	1.56	....	....	....	....	1.36	....	1.42	....	....	....	....	....	1.39	....
39-39.9	....	....	....	....	....		..	1.61	....	....	....	....	1.40	....	....	....	....	....	....	....	1.43	....
40-40.9	....	....	....	....	....	F.O.B. Standard Pipe Line	....	1.66	....	....	....	....	1.43	....	....	....	....	....	....	....	....	....

*F. o. b. ship.

‡Also McKittrick, Kern River, Kern Front and Round Mountain $0.70 thru 19.9 gravity; no higher gravity quoted. **Except Lakeview Area.

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High Spots Of Next Week's Meetings

26th National Safety Congress and Exposition, Kansas City, Mo., Oct. 11 to 15.

Oct. 11, Afternoon:
"Industry's Responsibilities in Community Safety", by H. W. Boggess, Sinclair Prairie Oil & Gas Co., Tulsa.
"Can the Safety Engineer Make Effective Motion Pictures? — A Demonstration of What One Company Has Done", by A. L. Anderson, Standard Oil Co. of California, San Francisco.
Oct. 12, Afternoon:
"Review of Unusual Refinery Accidents", by R. T. Henderson, Standard Oil Co. of Ohio, Cleveland.
Oct. 13, Afternoon:
"Operating Marketing Motor-Vehicle Equipment", by J. H. Brown, Tide Water Oil Co., New York.
"Lessons from Marketing Department Accidents", by F. R. McLean, Socony-Vacuum Oil Co., Inc. (White Star Division), Detroit.
"Does Gasoline Burn?" (Demonstration), by John T. Howell, Union Oil Co. of California.
Oct. 14, Luncheon Meeting:
"Statistical Review and Forecast of the Petroleum Industry", by H. N. Blakeslee, Department of Accident Prevention, American Petroleum Institute, New York.

National Oil Marketers Assn., Hotel Stevens, Chicago, Oct. 12, 13, 14.

Oct. 12, Afternoon:
"Balanced Selling", by J. S. Keller, The Chek-Chart Corp., Chicago.
Oct. 13, Morning:
"The Proposed Petroleum Marketing Divorcement Bill", by Hon. Fred Biermann, U. S. Congressman, Iowa.
"Conservation, Production Control, Proration, Taxation, and Competition", by Clarence J. Schock, Schock Independent Oil Co., Mt. Joy, Pa.
Afternoon:
"Fitting Fuel Oil Specifications to Burner Performance", by Milton A. Powers, Timken Silent Automatic Division, Timken-Detroit Axle Co., Detroit and chairman, ASTM Burner Fuel Oil Committee.

Oil-World Exposition, Inc., Houston, Tex., Oct. 11 to 16.

Oct. 12, Oil Chemists Division:
Morning:
"Chemical and Physical Methods for Extraction of Salts from Refinery Charging Stocks".
"Controversial Methods of Asphalt Testing".
Afternoon:
"The Treatment of Boiler Feed Waters".
"Comparison of Octane Numbers of Various Types of Refinery Products As Obtained by Different Methods".
"Accelerated Method of Determining Stability of Cracked Fuels".
Evening:
"Testing Methods of Evaluation of Used Motor Oils".
"Oxidation of Lubricating Oils".
Oct. 15, Refinery Engineering Session:
"Manufacture of Organic Chemicals from Petroleum and Natural Gas by Polymerization", by Dr. M. B. Cooke and S. R. Swanson, Alco Products, Inc., and Dr. C. R. Wagner, The Pure Oil Co., Chicago.
"Catalytic Polymerization and Its Application to Refining", by Dr. Gustav Egloff, Universal Oil Products Co., Chicago.
"Combination Selective Cracking", by Dr. E. R. Smoley, The Lummus Co., New York.
"Metallurgy in Petroleum Refining Equipment", by E. S. Dixon, The Texas Co., New York.
"Gasoline Treating and Sweetening Processes", by Dr. C. W. Rippie, Solvay Sales Co., New Orleans.
"Extraction of Salts from Refinery Stocks by the Electrical Process", by T. N. St. Hill, president, Petroleum Rectifying Co., Los Angeles.
Oct. 13 and 14, Refinery Measurement and Control:
"Measurement and Control of Refinery Processes", by Philip Darling, Pan American Refining Corp.

Independent Petroleum Assn. of America, Houston, Oct. 14, 15, 16.

Oct. 14, Morning:
"National Legislative Trends in the Petroleum Industry", by Russell B. Brown, general counsel of the association.
Afternoon:
"Pollution and Waste Disposal Measures", by J. D. Collett, Fort Worth, independent producer, and president, Mid-Continent Oil & Gas Assn.
Oct. 15, Afternoon:
"The Relation of Imports to Domestic Production", by Wirt Franklin, Wirt Franklin Petroleum Corp., Ardmore, Okla., and former president of the association.
Annual Banquet:
Speaker, Harold L. Ickes.

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Coming Meetings

General Expositions

The Greater Texas and Pan American Exposition, Dallas, June 12 to Oct. 31.

Oil Meetings—Expositions

26th National Safety Congress and Exposition, Kansas City, Mo., Oct. 11 to 15.
National Oil Marketers Assn., Stevens Hotel, Chicago, Ill., Oct. 12, 13 and 14.
Oil-World Exposition, Inc., Houston, Texas, Oct. 11 to 16.
Interstate Oil Compact Commission, Rice Hotel, Houston, Texas ,Oct. 14 and 15.
25th Annual Conference on Taxation, auspices New England State Tax Officials Association, Hanover, N. H., Oct. 15 and 16.
Independent Petroleum Assn. of America, Houston, Tex., Oct. 14, 15 and 16.
American Assn. of Petroleum Geologists, midyear meeting, William Penn Hotel, Pittsburgh, Pa., Oct. 14, 15 and 16.
American Welding Society, 18th annual meeting and welding exposition, Atlantic City, N. J., Oct. 18 to 22.
American Institute of Mining and Metallurgical Engineers, Atlantic City, Oct. 18 to 23.
National Tax Assn., 30th annual conference, The Lord Baltimore Hotel, Baltimore, Md., Oct. 25 to 28.
Indiana Independent Petroleum Assn., annual convention, Hotel Severin, Indianapolis, Oct. 27, 28.
Society of Automotive Engineers, annual dinner, Commodore Hotel, New York City, Oct. 28.
Mid-Continent Oil & Gas Assn. of Texas, annual meeting and convention, Dallas, Texas, Oct. 29 and 30.
National Automobile Show, Grand Central Palace, New York City, Oct. 27 to Nov. 3.
American Association of Petroleum Geologists, Pacific Section, Los Angeles, Calif., Nov. 4 and 5.
Society of Automotive Engineers, Regional Transportation Meeting, Newark, N. J., Nov. 6 to 12.
National Motor Truck Show, Newark, N. J., Nov. 6 to 12.
American Petroleum Institute, 18th annual meeting, Stevens Hotel, Chicago, Ill., Nov. 8 to 12.
American Trucking Assn., Inc., Private Carriers Div., Oil Field Haulers Div., Louisville, Ky., Nov. 15 to 18.
Oil Traders Assn. of New York, New York, Nov. 16.
American Institute of Chemical Engineers, annual meeting, St. Louis, Mo., Nov. 17, 18 and 19.
National Asphalt Conference, Memphis, Tenn., week of Dec. 6.